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# Prehistoric America.

Vol. III.

The Mound Builders.
Animal Effigies.
The Cliff Dwellers.
Myths and Symbols.
Archæological Relics.
Beginnings of Architecture.

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GRAND CANYON OF THE COLORADO.

# THE

# CLIFF DWELLERS

# AND

# PUEBLOS

BY

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DEDICATED

TO

WILLIAM H. HOLMES,

IN HONOR OF HIS WONDERFUL SKILL IN DESCRIBING AND DEPICTING
THE CLIFF-DWELLINGS OF THE MANCOS CANYON, AND AS A TOKEN
OF RESPECT FOR HIS UNIFORM COURTESY AND KINDNESS.

BY HIS SINCERE FRIEND,

STEPHEN D. PEET.

55712

# PREFACE.

THAT mysterious people called the Cliff-Dwellers, have been for many years the objects of much curiosity, and are still regarded with great interest. Various parties have entered the region where their works and relics were discovered; some of whom have written interesting accounts of their own explorations, and two or three have published books upon the subject. As a result, the mystery surrounding them, has been to some degree dispelled; so that they can no longer be regarded as so obscure and strange a people, as they once were.

The most of the parties who have entered the field have come to the conclusion, that they were the same people as those who are known under the name of the Pueblos, and that they practiced a very similar architecture; the main difference between them, consisting in the fact, that they were situated upon the borders of the Pueblo territory and were here subject to the attacks of the Wild Tribes, which have so long infested the region.

The author of this book, who is the editor of the American Antiquarian, has taken this as his clew, and so has used a double title. He has given descriptions, not merely of the cliff-dwellings and their local surroundings and history, but of their distribution and varied relations. His position is, that the cliff-dwellings were permanent abodes, but were built at different periods; some of them at a very ancient date; others at a period which was not very long before the discovery of America.

The development of the Pueblo art and architecture was entirely in the prehistoric period, and represents the progress which was made during that period, especially in that part of it which was called the Stone Age

The influence of environment is recognized, but as attended by the influence of an ethnic origin, which at present is somewhat uncertain. The subject of languages is not entered upon; even their myths and symbols have been left to another work.

The author has given several years of close study to the book, and has written the chapters at intervals. By this means he has been able to keep pace with the progress of discovery, and to give the results of the latest explorations. In presenting the volume to the public, he would make acknowledgment of the assistance which he has derived from reading the reports of all of the parties who have ever entered the field, beginning first with the early Spanish explorers; taking next the early American explorers, and continuing to draw from the reports and descriptions which have been written by every party which has ever visited the region, including those who have written for the popular magazines and for the newspapers. The names of the writers are given in the book, and a few, who have never written anything for publication, have been mentioned, especially those who are dwelling in the region and are familiar with the works and ruins in their own locality. Thanks are due to Mr. W. H. Holmes and Mr. F. H. Chapin; to the Chief of the Ethnological Bureau, the Superintendent of the Santa Fé Railroad, and to Flood & Vincent, for the use of cuts; and, also, to Mr. Lewis W. Gunckel, for the use of photographs.

* * *

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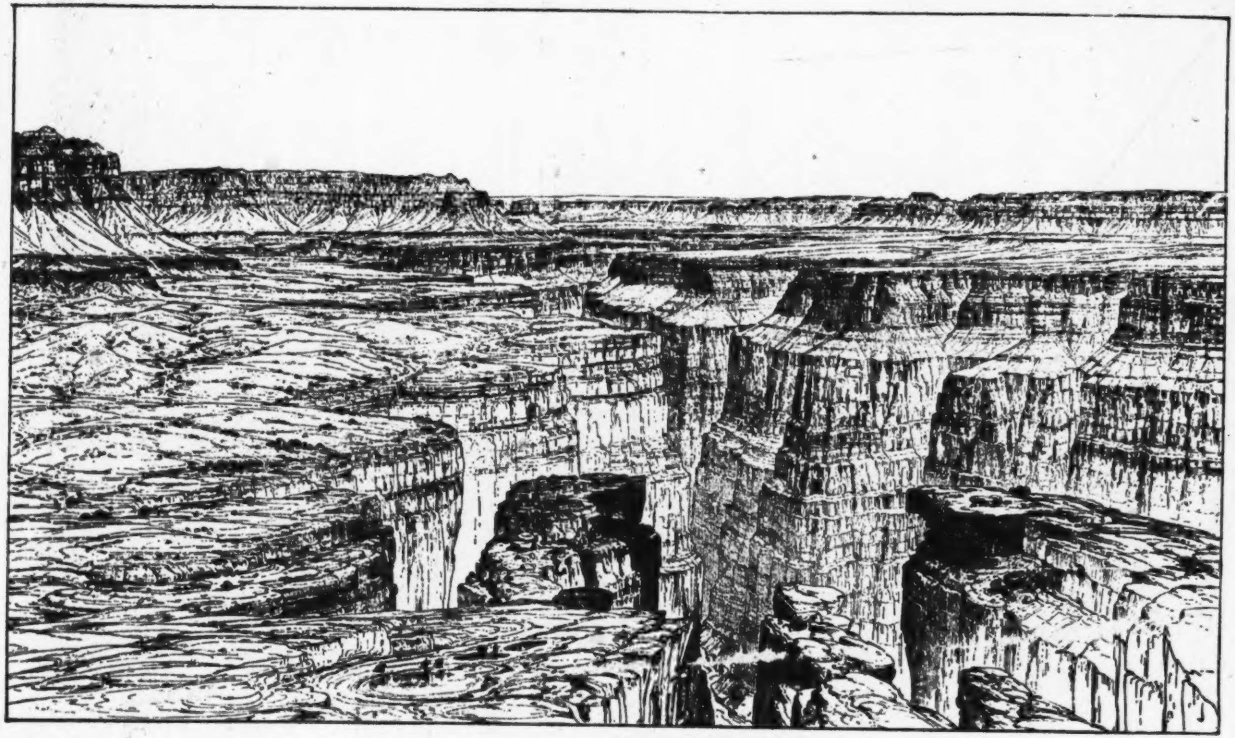
TRAIL ALONG THE CANYON.



GRAND CANYON AT FOOT OF THE TOROWEAP.

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# THE CLIFF DWELLERS

## CHAPTER I.

### THE GREAT PLATEAU AND ITS INHABITANTS.

There is a region in the deep interior of the American continent, to which the name Great Plateau has been given. The name expresses its geological character. It is, however, a region which furnishss a wonderful field to archæology, and deserves careful study on this account. There is no part of our great continent where more interesting problems are presented than by this. These problems relate not merely to the physical and natural history, but to human history as well. In fact, it is the human history which gives the chief interest to it, as that history is totally unlike any other on the face of the globe.

It appears that a portion of the human race found lodgment in the midst of these grand scenes of nature, but became isolated by reason of their situation. Here, they developed a form of society which was largely the result of the environment, but which culminated in a type of art and architecture which was most peculiar. There has been a great deal of mystery thrown around the people, and a name has been given to them which starts a thousand fancies—the name Cliff-Dwellers. The charm of this name does not come merely from the fact that the people dwelt so high up among the cliffs, as from the fact, that they developed so high a civilization in the midst of the cliffs.

The inquiry naturally arises, whether this civilization was altogether the result of environment, or was owing to some other influence. There are differences of opinion on this point, as some maintain that the Cliff-Dwellers and the Pueblo tribes were like a molten mass, which was thrown into this gigantic mould, and came out bearing the stamp, as thoroughly as a casting does that which is found in any ordinary furnace. Others, however, ascribe the condition of the Cliff-Dwellers to their remarkable intelligence, combined with the influence of inheritance and employment. It is probable that all these had their effect, but as the first (scenety) has been made so prominent, we shall give our thoughts to this, thus making it a background to the picture which we hope to draw in this volume. We do not believe that the background is the picture, but it is essential to it, and is always designed to set forth the picture more clearly.

We propose in this chapter to furnish descriptions of the Great Plateau, including the Grand Cañon of the Colorado, and other features; but, in doing so, shall draw largely from the writings of those who have spent time in exploring and surveying, but whose descriptions are buried in the midst of voluminous reports and are likely to be forgotten. It has long been our conviction that these ought to be brought to light.

I. We shall begin with a description of the topography of the entire region, and shall quote largely from the report of Mr. C. E. Dutton, which is contained in the Second Annual Report of the Geological Survey. He says:

> For convenience of geological discussion, Major Powell has divided that belt of country which lies between the meridian of Denver, Colorado, and the Pacific into provinces, each of which possesses topographical features which distinguish it from the others. The easternmost, he has named the Park Province. It is situated in the central and western parts of Colorado and extends north of that State into Wyoming, and south of it into New Mexico. It is pre-eminently a mountain region, having several long ranges of mountains. The structure and forms of these mountains are not exactly similar to those of any other region, but possess some resemblance to the Alps.
>
> As we pass westward of these ranges we enter a region having a very different topography. The mountains disappear and in their stead we find platforms and terraces, nearly or quite horizontal on their summits or floors and abruptly terminated by long lines of cliffs. They lie at greatly varying altitudes, some as high as 11,000 feet above the sea, others no higher than 5,000, and with still others occupying intermediate levels. Seldom does the surface of the land rise into conical peaks, or into long, narrow-crested ridges; but the profiles are long, horizontal lines, suddenly dropping down many hundreds, or even two thousand, feet upon another flat plain

RUINS ON A MESA.*

---

* We are indebted to the courtesy of the Santa Fe Railroad Company for many of the cuts used to illustrate this chapter.

below. This region has been very appropriately named by Major Powell, the Plateau Province. It occupies a narrow strip of western New Mexico, a large part of southern Wyoming, and rather more than half of Utah and Arizona.

West of the Plateau Province is the Great Basin, so named by Fremont because it has no drainage to the ocean. Its topography is wholly peculiar and bears no resemblance to either of the two just alluded to. It contains a large number of ranges, all of which are very narrow and short, and separated from each other by wide intervals of smooth, barren plains. The mountains are of a low order of magnitude for the most part, though some of the ranges and peaks attain considerable dimensions. Their appearance is strikingly different from the noble and picturesque outlines displayed in Colorado. They are jagged, wild, and ungraceful in their aspect, and, whether viewed from far or near, repel rather than invite the imagination.

FOOT TRAIL.

The Grand Canyon District is a part of the Plateau Province, and to this as a whole we call attention. As already indicated, it lies between the Park and Basin Provinces, and its topography differs in the extreme from those found on either side of it. It is the land of tables and terraces, of buttes and mesas, of cliffs and canyons. Standing upon any elevated spot where the radius of vision reaches out fifty or a hundred miles, the observer beholds a strange spectacle. The most conspicuous objects are the lofty and brilliantly-colored cliffs. They stretch their tortuous courses across the land in all directions, yet not without system; here throwing out a great promontory, there receding in a a deep bay, and continuing on and on until they sink below the horizon, or swing behind some loftier mass, or fade out in the distant haze. Each cliff marks the boundary of a geographical terrace and marks, also, the termination of some geological series of strata, the edges of which are exposed, like courses of masonry, in the scarp-walls of the palisades. In the distance may be seen the spectacle of cliff rising above and beyond cliff, like a colossal stairway leading from the torrid plains below to the domain of the clouds above. Very wonderful at times is the sculpture of these majestic walls. There is an architectural style about it, which must be seen to be appreciated. The resemblances to architecture are not fanciful or metaphorical, but are real and vivid; so much so that the unaccustomed tourist often feels a vague skepticism whether these are truly the works of the blind forces of nature, or some intelligence akin to human, but far mightier; and even the experienced explorer is sometimes brought to a sudden halt and filled with amazement by the apparition of forms as definite and eloquent as those of art. Each geological formation

KIVA AND PUEBLO.

exhibits in its cliffs a distinct style of architecture, which is not reproduced among the cliffs of other formations, and these several styles differ as much as those which are cultivated by different races of men.

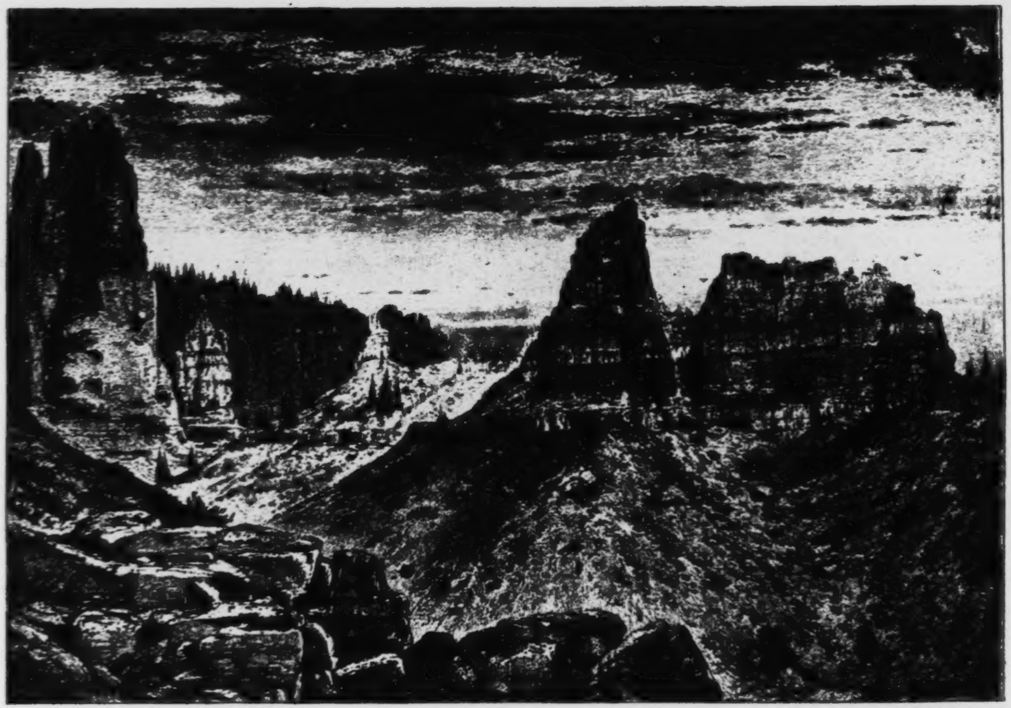
The character which appeals most strongly to the eye is the coloring. The gentle tints of an eastern landscape, the pale blue of distant mountains, the green of vernal or summer vegetation, the subdued colors of hillside and meadow, are wholly wanting here, and in their place we behold belts of brilliant red, yellow, and white, which are intensified rather than alleviated by alternating belts of gray. Like the architecture, the colors are characteristic of the geological formations, each series having its own group and range of colors.

The Plateau country is also the land of canyons, in the strictest meaning of that term. Gorges, ravines, and canadas are found, and are more or less impressive in every high region; and in the vernacular of the West all such features are termed canyons, indiscriminately. But those long, narrow, profound trenches in the rocks, with inaccessible walls, to which the early Spaniards gave the name *cayon*, or *canyon*, are seldom found outside the plateaus. There they are innumerable and the almost universal form of drainage channels. Large areas of Plateau country are so minutely dissected by them, that they are almost inaccessible, and some limited, though considerable, tracts seem wholly so. Almost everywhere the drainage channels are cut from 500 to 3,000 feet below the general platform of the immediate country. They are abundantly ramified and every branch is a canyon. The explorer on the mesas above must take heed to his course in such a place, for once caught in the labyrinth of interlacing side-gorges, he must possess rare craft and self-control to extricate himself. All these drainage channels lead down to one great trunk channel, cleft through the heart of the Plateau Province for eight hundred miles—the chasm of the Colorado, and the canyons of its principal fork, the Green River. By far the greater part of these tributaries are dry during most of the year, and carry water only at the melting of the snow, and during the brief periods of the autumnal and vernal rains. A very few hold small, perennial streams, coming from the highlands around the borders of the province, and swelling to mad torrents in times of spasmodic floods.

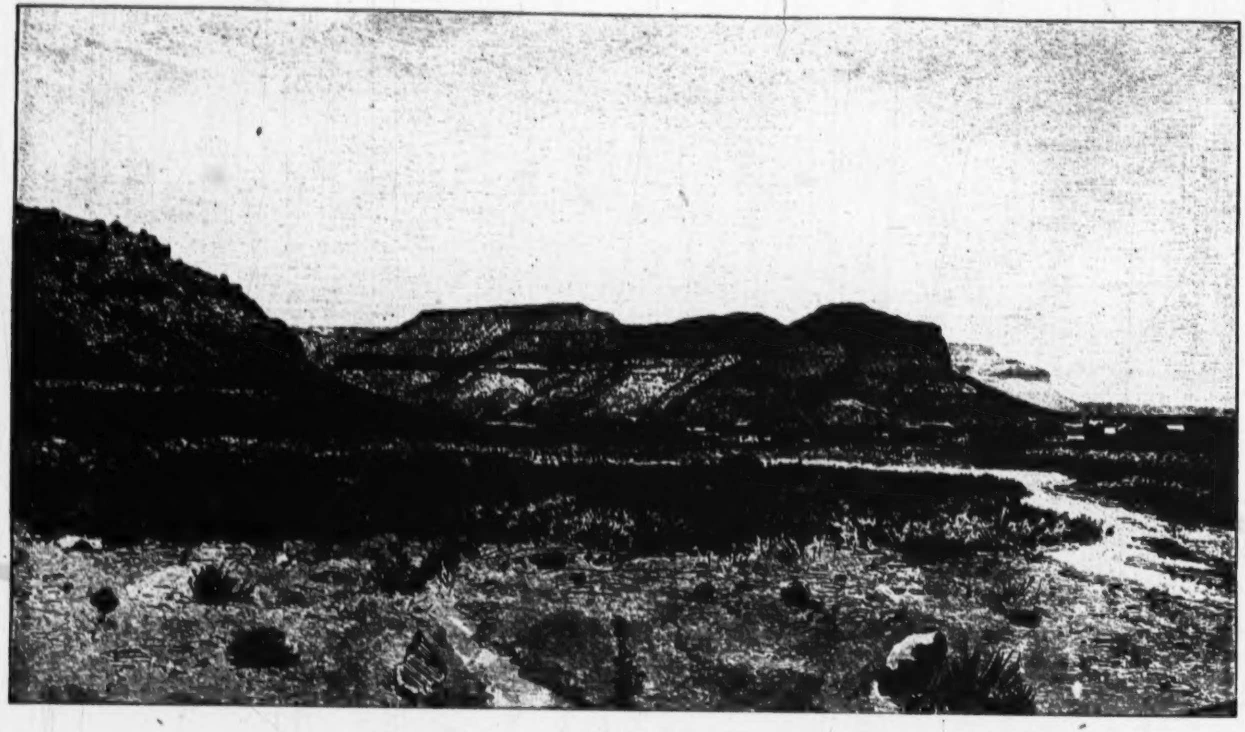
MESA AND PUEBLO AT SHUPAULAVI.

The region is, for the most part, a desert of the barrenest kind. At levels below 7,000 feet the heat is intense and the air is dry in the extreme. The vegetation is very scanty, and even the ubiquitous sage (*Artemesia tridentata*) is sparse and stunted. Here and there the cedar (*Juniperus occidentalis*) is seen, the hardest of arborescent plants, but it is dwarfed and sickly and seeks the shadiest nooks. At higher levels the vegetation becomes more abundant and varied. Above 8,000 feet the plateaus are forest-clad and the ground is carpeted with rank grass and an exuberant growth of beautiful summer flowers. The summers there are cool and moist; the winters severe and attended with heavy showfall.

The Plateau Province is naturally divided into two portions, a northern and a southern. The dividing barrier is the Uinta range. This fine moun-



PINK CLIFFS, PAUNSAGUNT PLATEAU.



VERMILLION CLIFFS AT KANAB—SHOWING FORM OF PLATEAU.

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tain platform is, in one respect, an anomaly among western mountain ranges. It is the only important one which trends east and west. Starting from the eastern flank of the Wasatch, the Uintas project eastward more than 150 miles, and nearly join perpendicularly the Park ranges of Colorado. Of the two portions into which the Plateau Province is thus divided, the southern is much larger. Both have in common the plateau features; their topographies, climates, and physical features in general, are of similar types, and their geological features and history appear to be closely related; but each has, also, its peculiarities. The northern portion is an interesting and already celebrated field for the study of Cretaceous strata and the Tertiary lacustrine beds. The subjects which it presents to the geologist are most notably those which are embraced under the department of stratigraphy—the study of the succession of strata and co-related succession of organic life. Otherwise the region is tame, monotonous, and unattractive. The southern portion, while presenting an abundance of material for stratigraphical study, and in this respect fully rivalling, and, perhaps, surpassing, the northern portion, also abounds in the grandest and most fascinating themes for the student of physical geography. The northern portion is almost trivial as to the scenery, while the southern is the sublimest on the continent. With the former we shall have little to do; it is the latter which claims here our exclusive attention.

The southern part of the Plateau Province may be regarded as a vast basin everywhere bounded by highlands, except at the southwest, where it opens wide and passes suddenly into a region having all the characteristics of the Great Basin of Nevada. The northern half of its eastern rim consists of the Park ranges of Colorado. Its northern rim lies upon the slopes of the Uintas. At the point where the Uintas join the Wasatch, the boundary turns sharply to the south, and for 200 miles the High Plateaus of Utah constitute the elevated western margin of the province.

The Grand Canyon District—the region draining into the Grand and Marble Canyons—is the westernmost division of the Plateau Province. Nearly four-fifths of its area are situated in northern Arizona. The remaining fifth is situated in southern Utah. Let us turn our attention for a moment to the portion situated in Utah. It consists of a series of terraces quite similar to those we have already seen descending from the summit of the Wasatch Plateau to the San Rafael Swell, like a colossal stairway. At the top of the stairs are the broad and lofty platforms of the High Plateaus of Utah; at the bottom is the inner expanse of the Grand Canyon District. The summits of the High Plateau are beds of the Lower Eocene Age. Descending southward, we cross, step by step, the terminal edges of the entire Mesozoic system and the Permian, and when we reach the inner floor of the Grand Canyon District we find that it consists of the summit beds of the carboniferous series, patched here and there with fading remnants of the Permian.

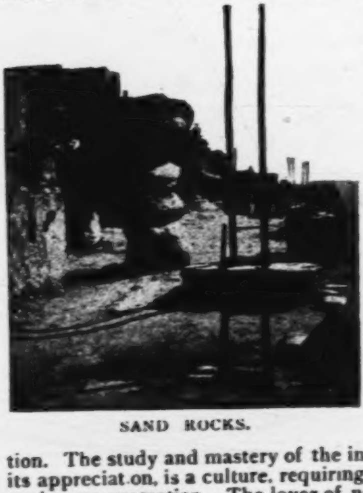
Thus we may note that the northern and eastern boundaries of the Grand Canyon District are cliff-bound terraces. Crossing the district, either longitudinally from north to south, or transversely from east to west, we find as we approach the southern or western border, that the carboniferous platform ascends very gradually, and at last it terminates in a giant wall, plunging down thousands of feet to the platform of a country quite similar to the Great Basin of Nevada. All the features are repeated and the desolation intensified in the dreadful region which is west and south of the Grand Canyon region.

Here, then, we have a birds-eye view of the topography of this region, written by one who is familiar with every part of it. We can see from the description that the Great Plateau was isolated from every other part of the continent. It was surrounded by higher mountains, and beyond the mountains by wide valleys—the Great Mississippi Valley on the east, the valley of the Snake River on the north, the valley, which is called the Great Basin, on the west, and the valley of the Lower Colorado on the south.

Dana, the celebrated geologist, says that a continent is characterized by a great valley situated between two or more ranges of mountains. According to this definition we may conclude that the Great Plateau is a continent above a continent, and may well be called the Air Continent; for it is lifted high up in the air, but is at the same time surrounded by higher peaks, and beyond the peaks are the great depths of air, which surround it as thoroughly as did once the rolling depths of water, which laved the shore in the ancient period when the mountains were new.

MESA CLIFF-SIDE.

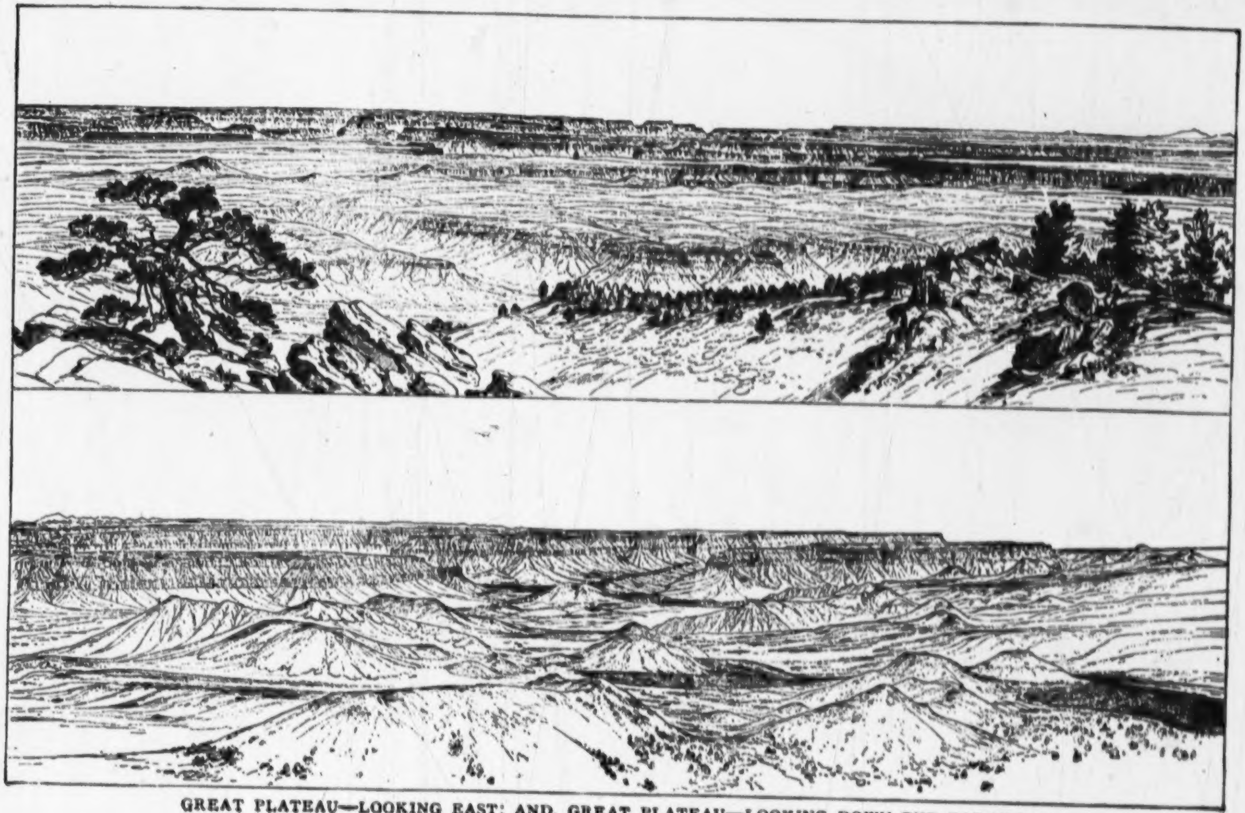
II. We turn, then, to the scenery. Of this we have some very graphic descriptions. These show the impressions which are made upon educated minds, but at the same time illustrate the necessity of coming into sympathy with the scene by long dwelling amid it, and becoming familiar with its changes.



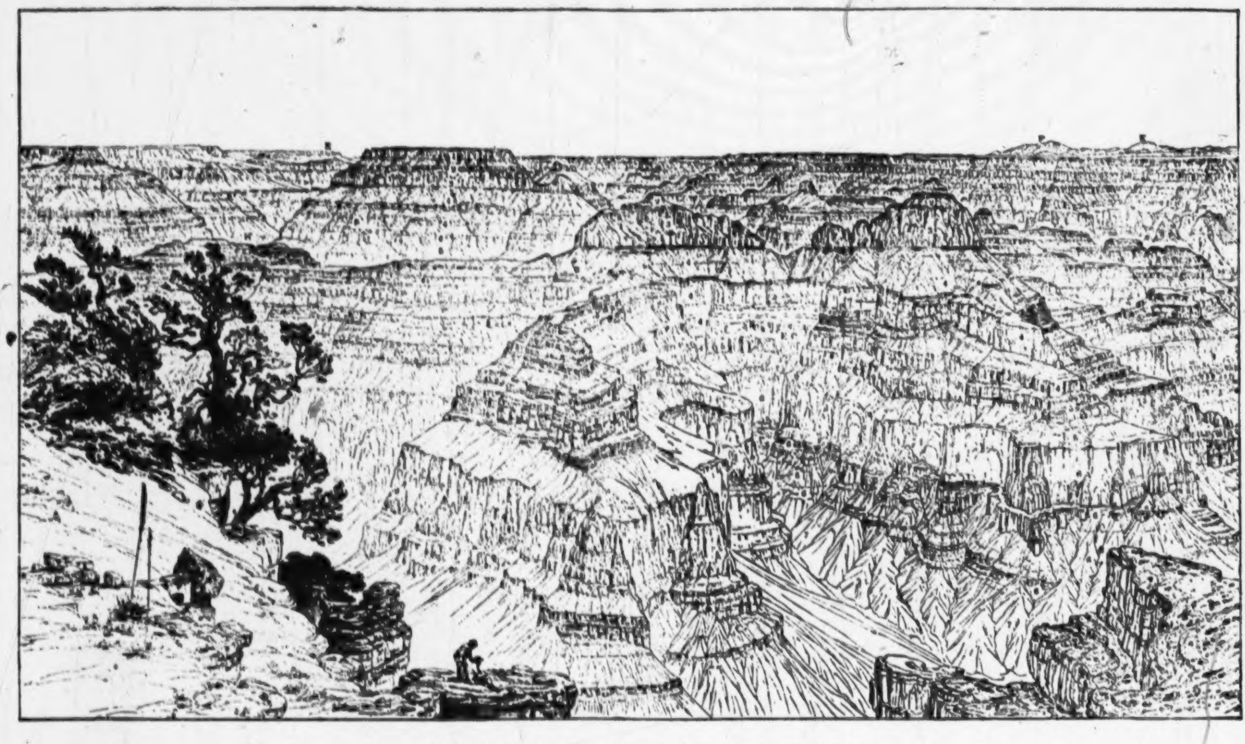
SAND ROCKS.

The following description is from Mr. C. E. Dutton's report:

> The Grand Canyon of the Colorado is a great innovation in modern ideas of scenery, and in our conceptions of the grandeur, beauty, and power of nature. As with all great innovations, it is not to be comprehended in a day or a week, nor even in a month. It must be dwelt upon and studied, and the study must comprise the slow acquisition of the meaning and spirit of that marvelous scenery which characterizes the Plateau country, and of which the great chasm is the superlative manifestation. The study and mastery of the influences of that class of scenery and its appreciation, is a culture, requiring time, patience, and long familiarity, for its consummation. The lover of nature, whose perceptions have been trained in the Alps, in Italy, Germany, or New England; in the Appalachians or Cordilleras, in Scotland or Colorado, would enter this strange region with a shock, and dwell there for a time with a sense of oppression, and, perhaps with horror. Whatsoever things he had learned to regard as



GREAT PLATEAU—LOOKING EAST; AND, GREAT PLATEAU—LOOKING DOWN THE TOROWEAP.



KEY TO THE PANORAMA FROM POINT SUBLIME.

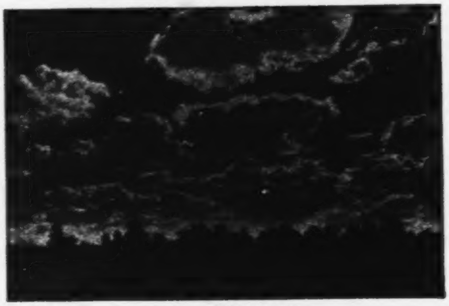
beautiful and noble, he would seldom or never see, and whatsoever he might see would appear to him as anything but beautiful and noble. Whatsoever might be bold and striking, would at first seem only grotesque. The colors would be the very ones he had learned to shun, as tawdy and bizarre. The tones and shades modest and tender, subdued yet rich, in which his fancy had always taken special delight, would be the ones which are conspicuously absent. But time would bring a gradual change. Some day he would suddenly become conscious that outlines, which at first seemed harsh and trivial, have grace and meaning; that forms, which seemed grotesque, are full of dignity; that magnitudes, which had added enormity to coarseness, have become replete with strength and even majesty; that colors, which had been esteemed unrefined, immodest, and glaring, are as expressive, tender changeful, and capacious of effects as any others.

Those who have long and carefully studied the Grand Canyon of the Colorado do not hesitate for a moment to pronounce it by far the most sublime of all earthly spectacles. If its sublimity consisted only in its dimensions, it could be sufficiently set forth in a single sentence. It is more than 200 miles long, from five to twelve miles wide, and from 5,000 to 6,000 feet deep. There are in the world valleys which are longer, and a few which are deeper. There are valleys flanked by summits loftier than the palisades of the Kaibab. Still, the Grand Canyon is the sublimest thing on earth.

The Plateau country abounds in close resemblances to natural carving of human architecture, and nowhere are these more conspicuous or more perfect than in the scarps which terminate the summits of the Markagunt and Paunsagunt Plateaus. Their color varies with the light and atmosphere. It is a pale red under ordinary lights, but as the sun sinks towards the horizon, it deepens into a rich rose color, which is seen in no other rocks and is beautiful beyond description. The cliffs are of the Lower Eocene Age consisting of lake marls very uniformly bedded. At the base of this series the beds are coarser, and contain well-marked, brackish-water fossils; but as we ascend to the higher beds we find the great mass of the Eocene to consist of fresh-water deposits.

The Trias is in most places separated from the Jura by a purely provisional horizon, which marks a change in the lithological aspect of the strata, and in the grouping and habit of the series. Sometimes the passage from one to the other is obscured, but more frequently it is abrupt. The Jurassic sandstone is without a likeness in any other formation and the sandstone of the Trias can ordinarily be distinguished from it miles away. One of the most conspicuous distinctions is the color, and it is a never-failing distinction. The Jurassic is white; the Trias is flaming red.

Superlative cloud effects, common enough in other countries, are lamentably infrequent here; but when they do come, their value is beyond measure. During the long, hot summer days, when the sun is high, the phenomenal features of the scenery are robbed of most of their grandeur, and can not, or do not, wholly reveal to the observer the realities which render them so instructive and interesting. There are few middle tones of light and shade. The effects of foreshortening are excessive, almost beyond belief, and produce the strangest deceptions. Masses which are widely separated seem to be superposed or continuous. Lines and surfaces, which extend towards us at an acute angle with the radius of vision, are warped around until they seem to cross it at a right angle. Grand fronts, which ought to show depth and varying distance, become flat and are troubled with false perspectives. Proportions which are full of grace and meaning are distorted and belied. During the midday hours the cliffs seem to wilt and droop, as if retracting their grandeur to hide it from the merciless radiance of the sun, whose every effulgence flouts them. Even the colors are ruined. The glaring face of the wall, where the light falls upon it, wears a scorched, over-baked, discharged look; and where the dense black shadows are thrown—for there are no middle shades—the magical haze of the desert shines forth with a weird, metallic glow, which has no color in it. But, as the sun declines, there comes a revival. The half-tones at length appear, bringing into relief the component masses; the amphitheatres recede into suggestive distances; the salients silently advance towards us; the distorted lines range themselves into true perspective; the deformed curves come back to their proper sweep; the angles grow clean and sharp; and the whole cliff arouses from lethargy and erects itself in grandeur and power, as if conscious of its own majesty. Back, also, come the colors, and as the sun is about to sink they glow with an intense orange-vermillion, that seems to be an intrinsic lustre emanating from the rocks themselves. But the great gala-days of the cliffs are those when sunshine and storm are waging an even battle; when the massive banks of clouds send their white diffuse lights into the dark places and tone down the intense glare of the direct rays; when they roll over the summits in stately procession, wrapping them in vapor and revealing cloud-girt masses here and there through wide rifts. Then the truth appears and all deceptions are exposed. Their real grandeur, their true forms, and a just sense of their relations are at last fairly presented, so that the mind can grasp them. And they are very grand—even sublime. There is no need, as we look upon them, of fancy to heighten the picture, nor of metaphor to present it. The simple truth is quite enough. I never before had a realizing sense of a cliff 1,800 to 2,000 feet high. I think I have a definite and abiding one at present.


CLOUD EFFECTS.

But though the inherent colors are less intense than some others, yet, under the quickening influence of the atmosphere, they produce effects to which all others are far inferior. And here language fails and description becomes impossible. Not only are their qualities exceedingly subtle, but they have little counterpart in common experience. If such are presented elsewhere, they are presented so feebly and obscurely that only the most discriminating and closest observers of nature ever seize them, and they so imperfectly that their ideas of them are vague and but half real. There are no concrete notions furnished in experience, upon which a conception of these color effects and optical delusions can be constructed and made intelligible. A perpetual glamour envelopes the landscape. Things are not what they seem, and the perceptions can not tell us what they are. It is not probable that these effects are different in kind in the Grand Canyon from what they are in other portions of the Plateau country. But the difference in degree is immense, and being greatly magnified and intensified, many characteristics become palpable which elsewhere elude the closest observation.

MOUNTAIN AND CLOUD

In truth, the tone and temper of the landscape is constantly varying, and the changes in its aspect are very great. It is never the same, even from day to day, or even from hour to hour. In the early morning its mood and subjective influences are usually calmer and more full of repose than at other times, but as the sun rises higher the whole scene is so changed that we cannot recall our first impressions. Every passing cloud, every change in the position of the sun, recasts the whole. At sunset the pageant closes amid splendors that seem more than earthly. The direction of the full sunlight, the massing of the shadows, the manner in which the side lights are thrown in from the clouds determine these modulations, and the sensitiveness of the picture to the slightest variations is very wonderful.

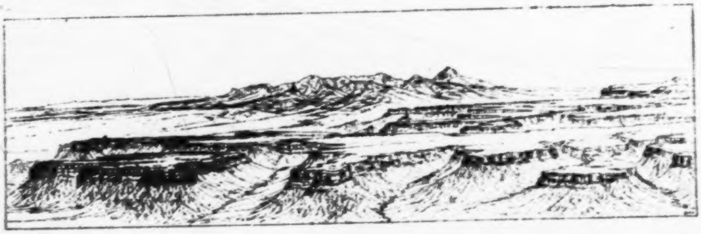
The rocks which are so striking in their form and size, and which bear so important a part in the scenery, are not all. There are colors in the rocks and shadows in the air which are as important as these. They are less substantial, but they add to the impression. We seem to be in dreamland when we look upon this atmospheric sea. The billows roll, perhaps, at our feet, but they rise also above our heads. We are like the one who sails through the air in his dreams and puts forth his hand to catch the sun. Clouds above and clouds below, one hardly realizes that his feet are upon substantial rocks. The effect of the cloud scenery, and of the color, upon the mind is certainly very great. Of this Mr. Dutton also speaks, as follows:

Those who are familiar with western scenery have, no doubt, been impressed with the peculiar character of the haze, or atmosphere in the artistic sense of the word, and have noted its more prominent qualities. When the air is free from common smoke it has a pale blue color, which is quite unlike the neutral gray of the East. It is always apparently more dense when we look towards the sun, than when we look away from it, and this difference in the two directions, respectively, is a maximum near sunrise and sunset. This property is universal, but its peculiarities in the Plateau Province become conspicuous when the strong, rich colors of the rocks are seen through it. The very air is then visible. We see it palpably, as a tenuous fluid, and the rocks beyond it do not appear to be colored blue, as they do in other regions, but reveal themselves clothed in colors of their own.

The Grand Canyon is ever full of this haze. It fills it to the brim. Its apparent density, as elsewhere, is varied according to the direction in which it is viewed and the position of the sun; but it seems also to be denser and more concentrated than elsewhere. This is really a delusion, arising from the fact that the enormous magnitude of the chasm and its component tissues dwarf the distances; we are really looking through miles of atmosphere under the impression that they are only so many furlongs. This apparent concentration of haze, however, greatly intensifies all the beautiful or mysterious optical effects which are dependent upon the intervention of the atmosphere.

Whenever the brink of the chasm is reached, the chances are that the sun is high and these abnormal effects in full force. The canyon is asleep; or it is under a spell of enchantment which gives its bewildering ranges an aspect still more bewildering. Throughout the long summer forenoon the charm which binds it grows in potency. At midday the clouds begin to gather, first in fleecy flecks, then in cumuli, and throw their shadows into the gulf. At once the scene changes. The slumber of the chasm is disturbed. The temples and cloisters seem to raise themselves half awake to greet the passing shadow. Their wilted, drooping, flattened faces expand into relief. The long promontories reach out from the distant wall, as if to catch a moment's refreshment from the shade. The colors begin to glow; the haze loses its opaque density and becomes more tenuous. The shadows pass, and the chasm relapses into its dull sleep again. Thus through the midday hours it lies in fitful slumber, overcome by the blinding glare and withering heat, yet responsive to every fluctuation of light and shadow, like a delicate organism.

Throughout the afternoon the prospect has been gradually growing clearer. The haze has relaxed its steely glare and has changed to a veil of transparent blue. Slowly myriads of details have come out and the walls are flecked with lines of minute tracery, forming a drapery of light and shade. Stronger and sharper becomes the relief of each projection. The promontories come forth from the opposite wall. The sinuous lines of stratification which once seemed meaningless, distorted, and even chaotic, now range themselves into a true perspective of graceful curves, threading the scallop edges of the strata. The colossal buttes expand in every dimension: their long, narrow wings, which once were folded together and flattened against each other, open out, disclosing between them vast alcoves illuminated with Rembrault lights tinged with the pale, refined blue of the ever present haze. A thousand forms, hitherto unseen or obscure, start up within the abyss, and stand forth in strength and animation. All things seem to grow in beauty, power, and dimensions. What was grand before has become majestic, the majestic becomes sublime, and, ever expanding and developing, the sublime passes beyond the reach of our faculties and becomes transcendent. The colors have come back. Inherently rich and strong, though not superlative under ordinary lights, they now begin to display an adventitious brilliancy. The western sky is all aflame. The scattered banks of cloud and wavy cirrus have caught the waning splendor, and shine with orange and crimson. Broad slant beams of yellow light, shot through the glory rifts, fall on turret and tower, on pinnacled crest and winding ledge, suffusing them with a radiance less fulsome, but akin to that which flames in the western clouds. The summit band is brilliant yellow; the next below is a pale rose. But the grand expanse within is a deep, luminous, resplendent red. The climax has now come. The blaze of sunlight poured over an illimitable surface of glowing red is flung back into the gulf, and, commencing with the blue haze, turns it into a sea of purple of most imperial hue—so rich, so strong, so pure—that it makes the heart ache and the throat tighten. However vast the magnitudes, however majestic the forms or sumptuous the decoration, it is in these kingly colors that the highest glory of the Grand Canyon is revealed.



MESA VERDE.

III. This leads us to the relation of the Great Plateau to its inhabitants. We have spoken of the effect of the environment upon human society, but the question is whether the effect here is commensurate to the scenery. Ordinarily we might expect that the people who dwelt amid such grandeur would unconsciously be influenced by it, and reach a higher grade of character than others. We do not find this to be the case, except in their mythology and in their view of the supernatural. In this, however, we find a most remarkable series of myths and legends in which all of the prominent features of the landscape are embodied. In them the mountain peaks, the deep gorges, the vast streams, the distant ocean, the many-colored rocks, the fleecy clouds, the glaring sunlight, the fierce storms, and the forked lightning figure conspicuously. The very things which we regard as the forces of nature, with them were supernatural beings and the divinities, whom they worshipped. They clothed them with different colors and gave them names, and seemed to be familiar with their history. These supernatural beings were their benefactors, and were always present. They dwelt within the rocks and had their furnished houses there. Some of them were born upon the tops of the mountains where the clouds meet, and continued to dwell there.

The nature powers were all personified, and the divinities were clothed and active. The lightnings were the arrows of a chief, who wore the clouds for his feathers, and ruled the storm at his will. There were sunbeam rafts, which floated in the sky, on which the divinities calmly sailed. There were caves beneath the earth in which their ancestors dwelt, but the divinities lightened these caves, and brought them out. There were floods which covered the valleys, but there were rainbow arches stretched above the floods, and the land became dry and was fitted for the abode of men. There were sacred lakes beneath which the spirits of the children, who had died, dwelt, but from their many-terraced homes, they sent their messengers to attend the sacred feast and to teach the people about the secret powers of nature. All these are contained in their mythologies, and will be found described in our book on "Myths and Symbols."

But the question which most interests us is that which relates to the character of the people. Was this affected by the scenery, or did it remain untouched and asleep? We conclude, as we study the people as they are, and were, that they partook far more of the quietude of the scene, than they did of its grandeur. This seems strange to the transient visitor, and especially to the uneducated mind, for it is probable that there are many visitors from civilized and advanced circles of society, who stand in the midst of these scenes and are as unmoved as the natives themselves. At least they fail to see its hidden significance.

Of course there is an inspiration which can be drawn from communings with nature, when she reaches such grandeur as exists here, provided one is equal to the effort of interpreting her mystic language. Sublimity is far more difficult to interpret than is ordinary beauty. One may commune with the delicate flower which grows in the crack and cranny of the rock, and feel the stirring of emotion at once; for it is like looking upon the face of a little child. the smile is involuntary, but sweeps over the face unconsciously. It is easy to catch the mood of nature and to feel the touch of tenderness, but where nature is so silent and yet so grand, the response is longer delayed. It is like looking at the silent Sphinx, which is half hidden in the sands of the desert, and is the companion of the Pyramids, which are as silent.

These distant regions, hidden so far away in the deep interior of the American Continent, have no associations to stir one's memories. Lofty as the peaks are which surround the Great Plateau, they are silent; often covered with the white shrouds which have fallen upon them from the skies, but oftener draped in that hazy blue atmosphere which makes them so distant to the vision. They seem to belong to another world than ours.

The colors which come from the varying tinges of the rocks are, indeed, very striking, and so are the jagged rocks which project from the sides of the mountains, but they always cause us to feel that some one is hidden beyond those shadows and that humanity has dwelt even in this great wilderness. The outlines of the rocks may resemble ancient castles, and we may imagine many things, but the impression is greatly heightened when we discover that there are actual ruins upon the rocks, and that those ruins were once inhabited and were used as castles by the ancient people, and a feeling of companionship is awakened. The enquiry at once arises: how long have these regions been occupied, who were the people who dwelt in these ruined structures, whence did they come, how long were they here, what was their life, where did they get their subsistence, whither have they gone, what was their history, and have they left any record?

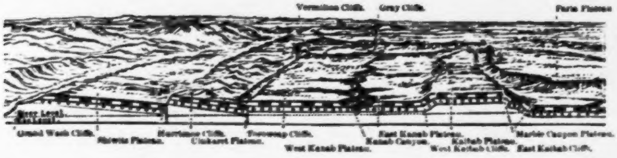
The scene is not merely one of nature's handiwork, wrought in grandeur, and left without inhabitants; nor is it one in which the past is entirely covered with shadows. There must be a reality back of this scene; a substance amid these shadows. We might imagine many things, and be filled with a strange rhapsody as we think of the unreal world. We might picture the unseen spirits as having dwelt here, and shadowy ghosts as flitting from peak to peak. This might increase our wonder and fill us with awe, resembling that which the untrained minds of the natives have often felt as they have looked upon the scene; for with them the natural and supernatural are one.

In that case, everything would be as weird and wild as a dream, as unreal as any picture which poet could draw. There might arise a sense of fear, and superstition might be aroused, and we find ourselves in the same mood as were the wild men, who were here before us. But this does not quite satisfy, we want to know about the people who formerly dwelt here. From these very heights we have gained glimpses of ruins which are as real as the rocks upon which they rest. These ruins stir our minds with new sensations, as they have the mindsof others, who have looked upon the same scenes.

We are familiar with the people who dwell here now, but we want to know about the people who dwelt here in the long ago.

We know, also, many things about the history of the Creation as it is written in the rocks, for the geologists have read this clearly for us. But we want to read the history of the people as well. The process has been a very slow one, and centuries have passed; but there must have been also a process by which the scene was peopled. We want to place the two records together and solve the mystery. The history of the Creation is a marvellous one, and must have taken many thousands of years to accomplish. This history, the geologist is able to read and point out its periods and processes. As President Jordan has said, the earth's crust has been making history and scenery, with all the earth-moulding forces steadily at work, and has rested in the sun for ten thousand centuries. Mountains were folding, continents were taking form, while this land of patience lay beneath a warm and shallow sea, as the centuries piled up layer upon layer of sand and rock.

At last the uplift of the Sierras changed the sands to dry land and by the forces of erosion the sands were torn away by slow process, until a mile or more of vertical depth had been stripped from the whole surface, leaving only flat-topped buttes here and there to testify to the depth of the ancient strata; if the swift river from the glacial mountains had done its work and narrowed its bounds, cutting its path through the flinty stone and dropped swiftly from level to level, until it reached the granite core of earth at the bottom, and a view from the canyon rim, shows at a glance how it all was done, we wonder that we cannot tell more about the people who came upon the scene, and the time at which they came.


Vermilion Cliffs.
Gray Cliffs.
Paria Plateau.
River Level.
Sea Level.
Grand Wash Cliffs.
Shivwits Plateau.
Hurricane Cliffs.
Uinkaret Plateau.
Toroweap Cliffs.
West Kanab Plateau.
East Kanab Plateau.
Kanab Canyon.
Kaibab Plateau.
West Kaibab Cliffs.
Marble Canyon Plateau.
East Kaibab Cliffs.

GEOLOGICAL RELIEF OF THE GREAT PLATEAU.

This is the scientists' interpretation, and brings to view the processes of nature; but what shall we say about the people who have dwelt amid this scene? What is their history, and what was the date of their advent? From what country did they come? To what race and stock did they belong? What were the channels, by which they reached these distant regions?

Access to this isolated plateau was originally gained by means of great streams, the most of which are difficult of navigation, but they never-the-less open a channel in different directions, as all of them ultimately reach the sea. There are mountain passes by which wandering tribes, who were accustomed to follow the paths wherever they lead, could reach it.

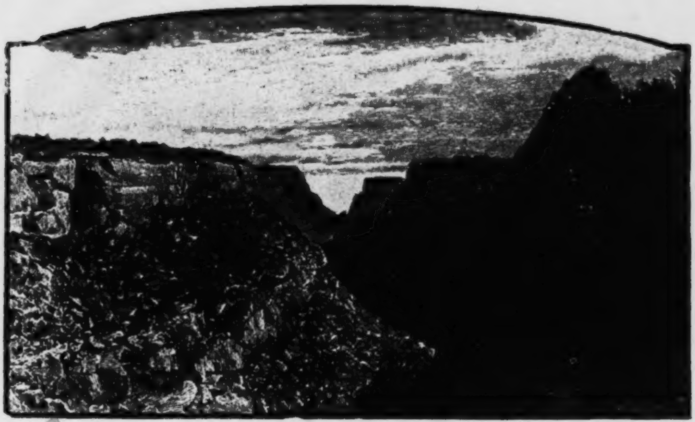
These different means of access have been employed by the different peoples who have entered the mysterious province.

The first white man to enter it, was a lone traveller, who was ship-wrecked upon the eastern coast, and passing from tribe to tribe wandered at length into the Great Staked Plain and made his way along the southern border, then passed on to the far west, and there made his report of the marvellous things which he had seen. Atter which a little band of Spanish cavaliers passed up from the south and traversed the valleys, and finally reached the Great Plateaus, and visited the pueblos which were scattered here and there, and at last passed over the mountains to the eastward and then continued their long wanderings in search of the fabulous land which they called Quivira. After the Spaniards, the Americans fitted out vessels and sailed around the continent, entered the mouth of the Colorado River, and finally reached the region by this means.

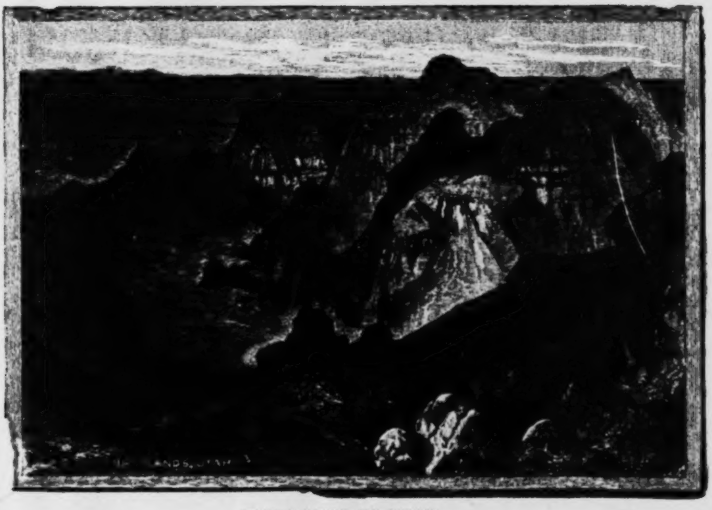
The problem now before us does not refer to the means of access, nor to the conveniences of travelling by which we may reach the distant region; but it does relate to the period when this mysterious locality was first peopled, and to the direction which was taken by those who first reached it. This is difficult to solve, though many theories are held in reference to it.

Some would place it as far back in a geological age as the time when this great air continent was, like other continents, surrounded by water, and raised but little above it. At that time the valleys, which are now so wide, were filled with seas, which have long since disappeared.

Others, however, would date the peopling of this mysterious continent at a very recent period. Judging from the language which has been used by some, one might think that it was but a short time before the discovery by Columbus. The true date is between these two extremes; but it can not be definitely fixed until more facts are secured.



SCENERY ON THE MANCOS.



BAD LANDS IN UTAH.

For description see page 27.

Courtesy of Chicago School Supply House.

SCENERY ON THE RIO GRANDE.

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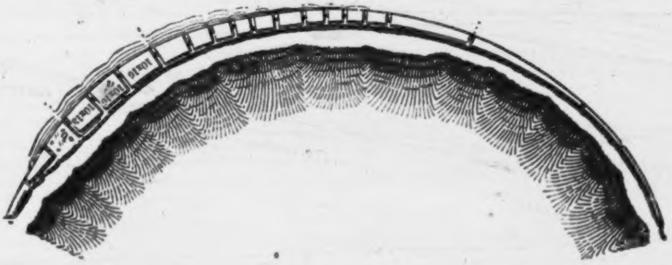
# CHAPTER II.

## "THE AGE" OF THE CLIFF-DWELLERS.

We have in a preceding chapter described the cave dwellings of Europe, and have there considered them as the representatives of the earliest abodes of primitive man. We are to devote this chapter to the cliff-dwellings but shall first draw the comparison between them and the ancient caves for by that means we shall be able to decide as to the age and social status of the people who inhabited the former. It is understood that the cliff-dwellers were the inhabitants of the great plateau of the West, and for aught we know, were the earliest inhabitants. The date of their appearance and of their disappearance is very uncertain, for there is an air of mystery about the people which is difficult to dispel. The most that we know of them is that at some indefinite time in the past they came into this region and amid the deep cañyons and on the high mesas made their homes, drawing their subsistence mainly from the valleys though occasionally they followed the chase, and fed upon the wild animals which lived in the forest and roamed over the mountains. They seem to have been influenced largely by their surroundings, for in their art they used the material which abounded, and in their architecture imitated the shapes of the cliffs. They are unknown to us except by their works and relics, but from these we learn that they were considerably advanced in the scale of human progress and furnish in this respect a strong contrast to the cave-dwellers of Europe. They were likewise advanced beyond the ordinary savage and hunter tribes, and in their social status represented the middle stage of barbarism, rather than any of the stages of savagery. They were a sedentary people given largely to agriculture but cultivated the soil by means of irrigation. They were organized into clans and



THE ECHO CAVE ON THE SAN JUAN.

tribes, and at first built their houses on the mesas and in the valleys. They seem to have been surrounded by wild tribes, who compelled them to find refuge in the sides of the cliffs, from which they were finally driven and then disappeared. Their history is unknown for there are no records left and very few traditions that can be relied upon. The pictographs which are found inscribed upon the rocks furnish some hints as to their religious notions, customs and myths, but they give very little information as to their history and their migrations. It is to the architectural structures and the relics that we look as our chief sources of information and especially the structures. These vary in character, but as a general thing they show the influence of the surroundings, for their form, shape, grouping and general character always conform to the situation in which they are found. The people were long enough in the country to have developed a state of society and a mode of life which were peculiar, and they adopted a style of architecture which has not been found anywhere else on the globe. This is best known under the term Pueblo style but the Pueblos and cliff-dwellings are so similar that both may be classed under the same head. The cliff-dwellings differ from the Pueblos only in the fact that they were erected in the side of the cliffs instead of in the valleys or upon the mesas. We propose to make these architectural works and the relics and tokens found around them and within them, the object of our study, and shall hope to ascertain the social condition, and the domestic life, of the people as well as their progress.

I The first question will be with regard to the age which they represent. The term age needs to be defined. Generally it means period which may be reckoned by years beginning with some fixed date. This is the use which is made of it in history, as the different nations have different eras which constitute the beginning of their history. The Greeks date theirs from the first celebration of the Olympian games, the Romans from the building of the city, the Hebrews from the exodus from Egypt, the Egyptians from the days of Menes their first King, the Persians from the birth of Zoroaster their great hero and religious founder, the Chinese from the birth of Confucius,the Turks and other Mohammedans from the birth of Mohammed, all Christian nations from the birth of Christ. There is also a use of the word which is peculiar to literature, for we have the Homeric age, the age of the poets and philosophers, the age of Demosthenes. Later on we come to the age of the Eddas and the Minnesingers, the age of the Schoolmen and the Elizabethan age. In art also we have the age of the Greek art, the Roman art, mediæval art, also the age of the renaissance, in art. In archæology, however, the term signifies something quite different, for it is made to express the social condition, and grade of progress which existed during prehistoric times, as the supposition is that these grades and stages followed one another in a regular order of succession and the index of the grades is found in the material of which the relics were composed, while the architectural structures are subordinate to the relics. Such was the case in Europe. In America it is different. We have here the same variety of relics, some of them rude, some of them finely wrought but they rarely furnish any clue as to the time in which they were used or the age to which they belonged, as many of them were contemporaneous and belonged to the same period. There are to be sure in America certain geographical districts which contain a preponderence of rude relics, and others which present those which are highly finished. The archæological map when properly made may be said to represent the different stages of progress and grades of society, which in Europe have been ascribed to the different ages, the lines here being horizontal and covering the surface of the continent, which in Europe are perpendicular and constitute an archæological column. According to this system of classification we should place the cliff-dwellings high up in the scale and make the geographical district in which they are found represent the last age, which in Europe borders close upon the historic period, for the structures correspond to those which there immediately preceded history, though the relics present a lower grade, and would be ascribed to an earlier age. It is probable if the monumental history of the world were written we should find that the order of succession would be about as follows: 1. The Cave-Dwellings which may be divided into different classes according to the relics and remains which are found within them.[*] 2. The kitchen middens in which are found the debris of camps and the remains of animals on which people fed. 3. The barrows and tumuli which show the burial customs of the ancient people. 4. The dolmens, and chambered tombs. 5. The lake-dwellings which are so common in Switzerland and "crannogs" common in Ireland and "terramares" in the north of Italy. 6 The burghs, towers, § nirhags which are found in Scotland, Ireland and in some cases in Sardinia. 7. The structures which are known to history, among which are the huts similar to the one occupied by Romulus and Remus and such tombs as have been found at Mycenæ and Tiryns.

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[*] The caves can be divided into three classes the earliest containing the bones of extinct animals such as the rhinoceros, hippopotamus, the elephas, primigenius, cave bear, hyena etc., the second by the bones of the rein-deer and other arctic animals, with occasional carvings and relics which show the presence of man, the last of the cave-dwellers presenting the bones of the horse, the aurochs, the bos-priscos or ancient ox and other animals which became domesticated.

§Perrott & Chipiez, say: "The architecture of the Aborigines of Sardinia exhibits a degree of originality witnessed nowhere else save in the Talagats of the Balearic Islands and the megalithic monuments of North Africa. Notwithstanding their rough and archaic character, both classes of structures, tombs and nirhags, show a distinct individuality. We are inclined to believe that Sardinia was occupied by two distinct people, differing from and at war with each other. The older inhabitants were those tribes respecting, whom we know nothing except that they were uncivilized and lived in rocky caverns. The latter were the builders of the nirhags, and may be called the nirhag people. These owing to the superiority of their arms and the solidity of their towers, were able to possess themselves of the more fruitful portions of the country: the early inhabitants gradually falling backward toward the centre without being pursued, for

In America we find a series which resembles these in the character of their architecture, but all of them contemporaneous. The main resemblance between them and the monuments of Europe consists in the grades of progress exhibited. The series would be as follows: 1. The ice-huts and Eskimo houses, also the shell heaps found on the north Atlantic coast. 2. The Ancient village sites, and ash heaps which are scattered over the forests of Canada. 3. The long houses and ancient villages of the Iroquois and the hunter-tribes of the great lakes. 4. The mounds and earth-works of the Mississippi Valley, the Ohio river and the Gulf States. 5. The wooden houses and ancient villages of the Indians of the North-west coast, including the highly wrought and grotesquely carved totem poles. 6. The cliff-dwellings and Pueblos scattered through the great plateau. 7. The ruins of the ancient cities of Mexico and Central America in which are found the pyramids and temples which were erected by the civilized tribes.

If we compare the two lists we shall find that the cliff-dwellings correspond to the towers and burghs of Europe, the pyramids in America, which are supposed to be the last of the prehistoric series correspond to the pyramids and temples of Egypt which are supposed to be the first of the historic series.

Such is the schedule which may be laid out by the study of the monuments as well as the study of the relics. It prepares the way for the consideration of the "ages."* The division of the prehistoric period into three distinct ages is confirmed. There were "successive periods of development" in both continents though the "chronological horizons" which have been recognized in Europe are lacking in America.†

II. The next inquiry will be in reference to the cliff-dwellings and their position among the prehistoric monuments. Our first

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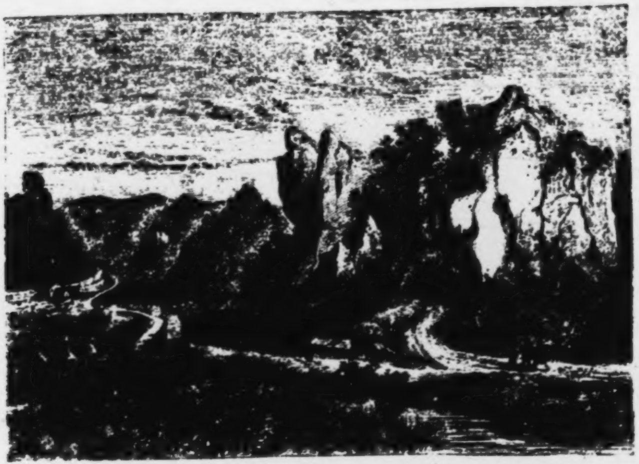
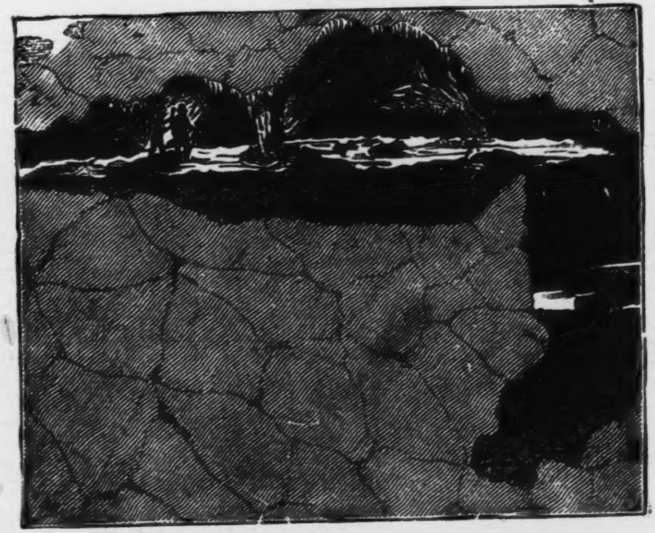
they left all that was worth having in their rear. The position was changed when the nirhag builders were invaded by the Carthaginians. A theory might be formed that the nirhags were placed to defend the people, but the probability is that they became absorbed with the Carthaginians. The Sardinians were at that stage when the means of defense were deemed of greater importance than the creature comforts, or the amenities of life. The tenor of life of this illiterate people was of as rude a description as well can be imagined. Cities they had none. The bare, miserable huts which formed their villages were arranged in serrated files around the nirhags. A saw, a horn, a comb a bone represent the whole of their domestic implements for personal use. The population consisted mainly of hunters and soldiers. Their aptitude in using lead, copper and bronze in making their arms and implements, when compared with pottery, attest this. Had the Phœnicians never visited Sardinia the use of tin and bronze would have been unknown to the inhabitants."

*We have already seen that the prehistoric works in Europe were to be divided into several classes belonging to different ages, and that taking them together they constitute a series in which the advancement of art and architecture can be recognized. The structures of the bronze age are as follows: (a) the palafittes or lake-dwellings which are situated in deep water, and contain relics of an advanced type (b) the ancient fortifications (c) circular towers, enclosures, etc.

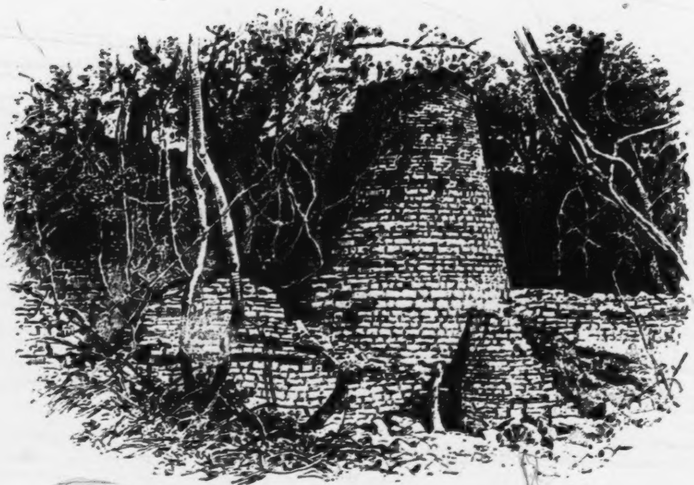
†The parts of the European series which are lacking in America are as follows: 1. The chambered tombs and dolmens. 2. The cromlechs standing stones and alignments. 3. The lake dwellings, though the last seem to have their correlatives in the sea-girt villages which have been discovered off the coast of Florida.



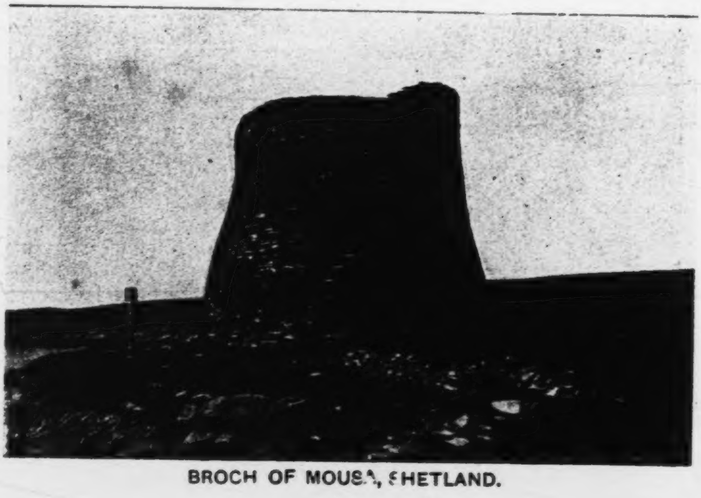
HOHLEFELS CAVE AT WURTENBERG.



BONE CAVE AT GAILENREUTH, BAVARIA.



TOWER IN SARDINIA.



BROCH OF MOUSA, SHETLAND.

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thought is that they are in great contrast to the caves of Europe, which are the only cliff-dwellings found there, but they correspond to the cavate houses which are very numerous in the Pueblo territory and represent the same stage of architecture.

The cliff-dwellings belong to a series which in Europe would be placed under the bronze age, but as no bronze was introduced into America they must be ascribed in common with the other monuments to the stone age. They, however, represent an advanced part of the stone age and so are in contrast with the cave-dwellings in Europe. In fact we are obliged to place the caves of Europe at one extreme and the cliff-dwellings at the opposite extreme, and are led to believe that the whole history of human progress, which took place during prehistoric times, is recorded in the structures which were erected between these two ages.*

There is another important point to be mentioned here. In Europe the monuments and relics seem to follow one another in the order of time, and exhibit different periods or ages. In America each series begins abruptly without any preceding stage. In fact the civilization of America, whatever it was, seems to have sprung, like Athene, from the head of Jupiter, fully armed. This has been noticed by others, as the following extract from Sir Wm. Dawson will show:

> "The abrupt appearance of man on this continent, his association with animals which belong to the most recent quarternary period, and the entire lack of evidence that he ever associated with any of the extinct animals, makes the contrast between the two very great. His introduction into Europe was at the close of the great ice age and yet mysterious revolutions of the earth occurred in that age. The continual oscillation may have gone on at intervals for many thousands of years; but the last period of the elevation is the equivalent of the early appearance of man and joins upon the Paleolithic age. The contrast between America and Europe is that the Paleolithic age is left out and the geological time joins hard upon historic times. The real interest in the prehistoric people here, such as the mound-builders and cliff-dwellers, is not in their antiquity but in the fact that they reproduce a condition of society which immediately preceded history. They show to us that condition of society on which history was built which existed in the East two or three thousand years before the Christian era and perhaps five thousand years before the Discovery. Some

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*All caves in Belgium, France, England, etc., which were easily accessible, and provided with a sufficient opening, were inhabited. In the middle was the hearth, paved with sand-stone or slate, and around this the family gathered during the season of intense cold. There were caves also, which being too much exposed to the weather, served only as a dwelling in summer. Such occur in the south of France, and are destitute of any traces of a hearth, though otherwise affording the clearest evidence of having been inhabited by men. The caves in Europe which give the most evidence of having been occupied are three grottos of Les Eyzies, Laugerie, Basse and La Madelaine, in the department of Dordogne. The first of these is high and wide enough to enable the light to penetrate throughout being 12 meters deep, 16 broad, and 6 meters high; it appears to have been used in the middle ages as a stable for horses; When Lartet and Christie began their explorations, the grotto had been considerably enlarged and deepened by earlier occupants, though the explorers found at the bottom a compact, floor, from which projected masses of blackish stalagmite, flint instruments, stones and pieces of bone; this bone breccia lay immediately on the rock floor of the cave, and showed a thickness of one of three decemeters. Large pieces were broken loose, which were sent partly to different museums, but in greater quantities to Paris, with a view to more exact examination. The station of Laugerie-Basse is partly in the hollow of a rock, whose face is 100 feet high, while a part of the formation, on which appeared traces of an open fire place, extended outwardly in front of the cavern.

imagine that this continent was inhabited by the Aborigines long before the beginning of history else-where, but for the present we have no evidence to prove it. This is not denying that there may have been a paleolithic age in America, yet so far the evidence is unsatisfactory—for all the relics which in Europe are ascribed to the three age, are here crowded into the single one, the Neolithic—the cliff-dwellings representing the last part."

III. This leads us to consider the relative age of the cliff-dwellings and caves. On this there seems to be a difference of opinion, some think the cliff-dwellings as ancient as the caves of Europe and ascribe to them a marvellous antiquity, while others think they were very modern, and were perhaps occupied after the advent of the white men, though no relics have been discovered in them which would show contact with the whites, the truth lies probably between these two classes, for there is evidence that the cliff-dwellings were occupied at different periods, some of them very early, earlier than any of the Pueblos, others quite late.

We shall quote from both classes. The following is from Mr. W. H. Holmes, who visited and described the group of cave-dwellings and towers on the Rio San Juan, and furnished a drawing of the cliffs and of the towers above the cliffs.[*]

"On examination I found them to have been shaped by the hand of man, but so weathered out and changed by the slow process of atmospheric erosion that the evidences of art were almost obliterated.

"The openings are arched irregularly above, and generally quite shallow, being governed very much in contour and depth by the quality of the rock.

"The work of excavation has not been an extremely difficult one even with the imperfect implements that must have been used as the shale is for the most part soft and friable.

"It is also extremely probable that they were walled up in front and furnished with doors and windows, yet no fragment of wall has been preserved. Indeed so great has been the erosion that many of the caves have been almost obliterated, and are now not deep enough to give shelter to a bird or bat. This circumstance should be considered in reference to its bearing upon its antiquity. If we suppose the recess to be destroyed as six feet deep, the entire cliff must recede that number of feet in order to accomplish it. If the rock were all of the friable quality of the middle part, this would indeed be a matter of a very few decades ; but it should be remembered that the upper third of the cliff face is composed of beds of comparatively hard rocks, sandstones and indurated shales. It should also be noted still further that at the base of the cliff there is an almost total absence of debris or fallen rock, or even of an ordinary talus of earth, so that the period that has elapsed since these houses were deserted must equal the time taken to undermine and break down the six feet of rock, plus the time required to reduce this mass of rock to dust; considering also that the erosive agents are here unusually weak, the resulting period would certainly not be inconsiderable."[§]

The view given by Prof. Cope is the same as that given by by Mr. Holmes; he formed his opinion as to the antiquity of the ruins from the erosion which was manifest, and from the evidences of the change of climate. This has been controverted, it is now held by many that the climate is exactly the same when the ruins and the caves were inhabited as now, but the reservoirs and means of storing up water, near the Pueblos, have been destroyed. The following is his language:

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[*] See Hayden's report for 1876, Bulletin Vol. 1, No. 1.

[§] "Figure 7 gives a fair representation of their present appearance of these dwellings, while their relations to the groups of ruins above will be understood by reference to page 183. These ruins are three in number—one rectangular and two circular. The rectangular one, as indicated in the plan C, is placed on the edge of the mesa, over the more northern group of cave-dwellings; it is not of great importance, being only 34x40 feet, and scarcely 2 feet high; the walls are one and one-half feet thick and built of stone."

> "In traversing the high and dry Eocene plateau west of the bad land bluffs, I noticed the occurrence of crockery on the denuded hills for a distance of many miles. Some of these localities are fifteen and twenty miles from the edge of the plateau, aud at least twenty-five miles from the edge of the Gallinas Creek, the nearest permanent water. In some of these localities the summits of the hills had been corroded to a narrow keel, destroying the foundations of the former buildings. In one locality I observed inscriptions on the rocks, and other objects, which were probably the work of the builders of these stone towns; I give a copy of figures which I found on the side of a ravine near to Abiquiu on the river Chama. They are cut in jurrassic sandstone of medium hardness, and are quite worn and overgrown with the small lichen which is abundent on the face of the rock. I know nothing respecting their origin. It is evident that the region of the Gallinas was once as thickly inhabited as are now the more densely populated portions of the Eastern states. The number of buildings in a square mile in that region is equal to, if not greater than, the number now existing in the more densely populated rural districts of Pennsylvania and New Jersey. Nevertheless if we yield to the supposition that during the period of residence of the ancient inhabitants the water supply from rains was greater than now, what evidence do we possess which bears on the age of that period? There is no difference between the vegetation found growing in these buildings and that of the surrounding hills and valleys; the pines, oaks and sage brush are of the same size, and to all appearances of the same age. I should suppose them to be contemporary in every respect. In the next place the bad lands have undergone a definite amount of atmospheric erosion since the occupancy of the houses which stand on their summits. The rate of this erosion under present atmospheric influence, is undoubtedly very slow. The only means which suggested itself, at the time, as available for estimating this rate was the calculation of the age of the pine trees growing near the edge of the bluffs."

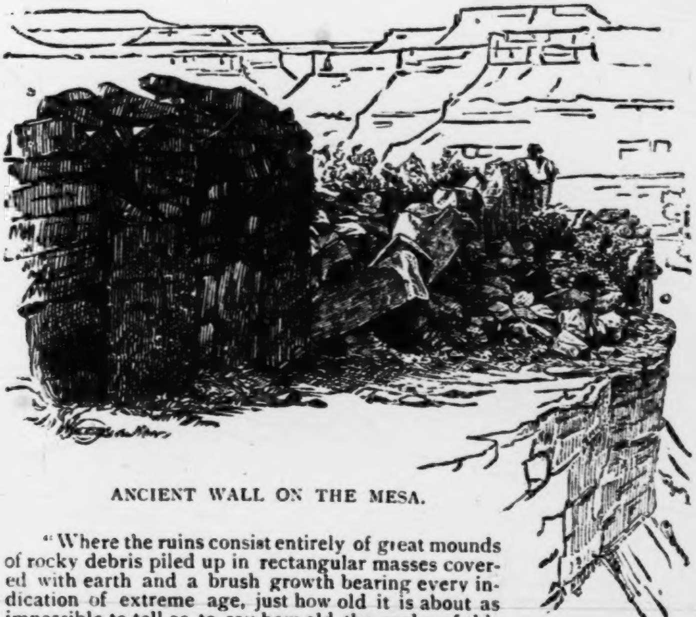
Such was the view of the early explorers. Others, however, have noticed the different periods of occupation. These are indicated by the relics and remains as well as the structures. Among the relics the pottery is the most suggestive. It appears there were several kinds of pottery, white decorated with black lines, red with black geometrical designs, corrugated, indented plain red and plain black coarsely glazed. Of these the white with black lines is regarded as the most ancient as it is found with the most ancient remains. Many specimens of this kind of pottery are found in various localities, among the cliff-dwellings of the San Juan among the ancient ruins west of the Rio Grande, and among the Portreros in South Eastern New Mexico and a few specimens in Arizona in the Valley of the Gila. It is found oftener in the ruins of small houses and near the ancient caves or cavate houses, than among the Pueblos, thus showing that the caves were first occupied and preceded the Pueblos. In the northern section of this Pueblo territory the class of pottery is found which in Utah and New Mexico is characteristic of the small houses, but here appears associated with all kinds of ruins, detached family dwellings, round towers, cliff-houses, villages built in caves and "rock-shelters." In the cliff-houses and cave-dwellings which line the walls of Canyon de Chelley, the black and white, the corrugated, the indented ware, is found, and with it some quite handsomely decorated, thus showing that even in this region there was a succession. Mr. Nordenskjold noticed that among the cliff-dwellings on the San Juan, the black and white was associated with the oldest and rudest ruins and this with the rude character of the foundation walls as well as the human remains discovered led him to believe that among the cliff-dwellers there were different periods of occupation and possibly different tribes. A similar succession has been recognized in other parts of the Pueblo territory. Mr. Bandelier found cave-dwellings at the west of the Rio Grande and among the Portreros, which contained many specimens of pottery of the ancient types, namely black and white, which show that here at least, there were people who made permanent homes, and that the small houses were not mere temporary refuges or resorts. He says:

> "The Potrero Chata represent two varieties of ancient architecture each accompanied by a distinct type of pottery. The small house ruins, of which the potsherds belong to the ancient kind, cannot have been mere summer ranches, for it is not presumable that the Indians would use one class of earthenware for winter and another kind in summer. Hence I consider myself justified in concluding that there were two distinct epochs of occupation. Wherever the caves stand without Pueblo ruins, in the immediate vicinity, they show almost exclusively the old kinds of potsherds, the black and white or gray and the corrugated. This would indicate that the artificial caves and the small houses belong to the same period, anterior to the many storied Pueblos. This is confirmed by another fact. While the buildings in this vicinity, whether large or small, are made of blocks of tufa, the walls of the Pueblos seem well preserved but the small houses are reduced to the foundation rubbish."

The same author speaks of the ruins of Portrero de Las Vecas and of the stone idols found near them. The name applied to the locality signified "where the panthers lie extended." He refers to the life size images of panthers which lie a few hundred yards west of the ruins in low woods near the foot of the cliffs. The age and object of the images is unknown, but the fact that pottery of a coarsely glazed and black and white as well as corrugated type abound near the ruins would show that they are ancient. They possibly were the totems of an ancient tribe though they have been ascribed to the Queres—a tribe still dwelling in the region.

Mr. Bandelier speaks of two other images of panthers which were situated on a mesa which rises above the Canada 304 feet in height. They are situated in the open space, but are in better condition than those on the Potrero de las Vecas as the rock on which they were carved is much harder, and has consequently resisted atmospheric erosion far better. There is a tradition among the Cochitis that they were made by their ancestors, who were the inhabitants of Kuapa, an ancient village situated about a mile away. They were probably the shrines of a people who worshiped the panthers as one of their prey Gods, very much as the Zunis did before the advent of the whites, and do even at the present day.

Mr. W. H. Jackson also speaks of ancient cave-dwellings walled up circular orifices in the rock generally inaccessible, but approached by steps or small holes cut in the rock though the steps are now so worn down by the disintegrating influences of time that they are hardly perceptible. He speaks also of another locality



ANCIENT WALL ON THE MESA.

"Where the ruins consist entirely of great mounds of rocky debris piled up in rectangular masses covered with earth and a brush growth bearing every indication of extreme age, just how old it is about as impossible to tell as to say how old the rocks of this canyon are. Each seperate building would cover generally a space of about 100 feet square, they are generally subdivided into two or four apartments. There were no cave-dwellings in the neighborhood of this group, but two or three miles below several occurred one of which is built in a huge niche in the solid wall of canyon with its floor level with the valley."

"Among the ruins on the Epsom Creek within a distance of fifteen miles there are some sixteen or eighteen promontories and isolated mesas

> every one of them covered with ruins of old and massive stone built structures. They average in size one hundred by two hundred feet square, down to thirty by fifty feet, always in a solid block, and, with one exception, so nearly similar that a description of one will fairly represent all. The peculiarity here consists principally in the size and shape of the stones employed as well as in the design of its ground plan. The ruin occupies one of the small isolated mesas, whose floor is composed of a distinctly laminated sandstone, breaking into regular slabs from eighteen inches to twenty-four inches in thickness; these have been broken again into long blocks and then placed in the wall upright, the largest standing five feet above the soil in which they are planted. Very nearly the entire length of this wall is made up of the large upright blocks of even thickness, fitting close together, with only occasional spaces filled up with smaller rocks. In one place the long blocks have been pushed outward by the weight of the debris back of it. One side of the large square apartment in the rear is made of the same kind of rocks, standing in a solid row. The walls throughout the rest of the building are composed of ordinary sized rocks, with an occasional large upright one. Judging from the debris, the walls could not have been more than eight or ten feet in height. The foundation line was well preserved, enabling us to measure accurately its dimensions. The large square room was depressed in the centre, and its three outside walls contained less material than in the rest of the building. No sign of any aperture, either of window or door, could be detected. The more numerous class of ruins occupying the mesas and the promontory points consists of a solid mass of small rectangular rooms arranged without appearance of order, conforming to the irregularities of the surface upon which they are built, and covering usually all the available space chosen for their site. All are extremely old and tumbled into indefinite ridges five or six feet high with the stones partially covered with sage brush, grease-wood and junipers. They occupied every commanding point of the mesas-usually so placed in the bends as to afford a clear outlook for considerable distances up and down the canyon. They resemble in this respect the sites chosen by the Moquis in building their villages ; but we were not able to trace the resemblance further, from the extremely aged and ruinos state in which these remains are found."

IV. The relative age of the "cavate lodges" and the "cliff-dwellings" may well be considered in this connection. On general principles we might consider that the caves were the older, for they are ruder, and the scenery wilder yet the cliff-dwellings themselves were strangely enough, sometimes placed at almost incredible heights, and amid the wildest scenes of nature. There is an unwritten history in these varied structures, and there is a temptation oftentimes to read into them, a fabulous antiquity.

We judge from these ruined walls and their proximity to the caves, as well as the character of the caves themselves, that the cliff-dwellers were much farther advanced than the cave-dwellers of Europe. Even the caves which seem to be very old have ruined towers connected with them, which show much skill in architecture. The age of the caves is of course unknown, but it seems to be very considerable.

There is another side to this subject. The caves and dwellings discovered by these gentlemen undoubtedly belong to an early period of the Pueblo's and cliff dweller's history, but there are also caves which were occupied at a much later date and it will therefore be well to examine them before we draw conclusions in reference to the relative age of the caves and the cliff-dwellings. These are situated in the midst of the very plateau where the cliff-dwellings are found and probably belonged to the same people, and to the same age. They differ in nearly all respects from the caves of Europe, for they evidently belong to the neolithic age, and the same part of the age to which the cliff-dwellings belong, but they illustrate a fact which is as common in modern as in ancient times. The people may have reached the same grade of civilization, and have followed about the same kind of life, using the same kind of tools, implements, utensils, and yet be living in very different kind of houses, inasmuch as their circumstances and resources differed. In this respect prehistoric people were not different from historic people. It is then no evidence of very great age if it is proved that people lived in caves, for there are caves in Europe which are occupied even to this day, and it is supposed by many of the explorers that some of these caves of the far west were occupied after the cliff-dwellings. Such seems to be the opinion of Maj. J. W. Powell, Mr. Ad. F. Bandelier, Mr. Cosmos Mendeliff and others. Mr. Bandelier says:

> "Cavate lodges, cave-dwellings and cliff-dwellings are only different phases of the same thing. There are but three regions in the United States in which cavate lodges are known to occur in considerable numbers, viz: on San Juan river, near its mouth, on the western side of the Rio Grande, near the Pueblo of Santa Clara; and on the eastern slope of the San Francisco mountain, near Flag-staff, Arizona. To these may now be added the Rio Verde region. Cave villages of the kind described are numerous, occupying an area of about three thousand square miles. They are merely a local feature to which the Indian was induced to resort by the nature of the prevailing geological formation."

It may be well then to study the different localities in which the so called cavate lodges are found and compare them with those where the cliff-dwellings abound. It will be seen that these caves or cavate lodges like the caves of Europe are in the midst of wild and mountainous regions, but in regions in which volcanic rocks are friable and so caves are easily excavated.

The most interesting locality is that west of Santa Clara. Here there are two high cliffs which are visible for thirty miles; their white ash-colored stone making them very conspicuous. One of them is called the Shufinne. A view of this rock with the caves dug out of it may be seen in the cut. Mr. Bandelier describes it in the following words:

> "Twelve miles from the Rio Grande the light colored pumice-stone and volcanic ashes of which the mesas are mostly formed rise in abrupt heights. On the north side a castle-like mesa of limited extent, detaches itself from the foot of the Pelado. The Tehuas call it the Shu-finne, and I have seen it distinctly from a distance of thirty miles. It is not the absolute height of the rock (I should estimate it at not over 150 feet above the mesa,) but the almost perfect whiteness of its precipitous sides and lower slopes against the dark mass of mountains that makes it so conspicuous. The perimeter of the Shu-finne is not very large, and its base is surrounded by cedar and

juniper bushes with a sprinkling of low pinon trees. Two-thirds of the elevation of this rock consist of a steep slope covered with debris of pumice and volcanic tufa. Along the base of the vertical upper rim small openings are visible which are the doorways of artificial caves. The Shu-finne contains a complete cave-village, burrowed out of the soft rock by the aid of stone implements."

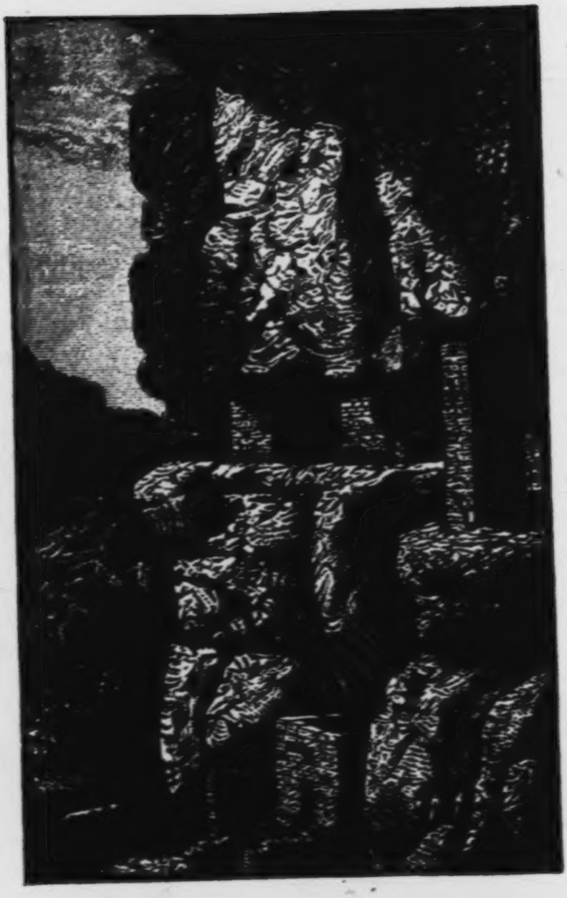
The Pu-ye lies lower than the Shu-finne and, as seen from it, the latter looms up conspicuously in the north, like a bold white castle. The caves extend at irregular intervals in a line nearly a mile long, sometimes in two, and occasionally three rows. They must have been capable of harboring at least 1000 people. In some places beams protrude from the rock, showing that houses have been built against it, along side of cave-dwellings. See plate.

South of the Pu-ye extends a level space whose soil appears to be quite loamy and fertile, and on this level are traces of garden spots. There is little pottery about the ruins. In some of the enclosed spaces or garden plots, trees have grown up. The ruins, as well as the almost obliterated artificial caves at the base of the mountain, seem to be much older than cave-villages of the Shu-finne and Pu-ye, as some of the caves show the front completely worn away, leaving only arched indentations in the rock. There seem to be vestiges of two distinct epochs marked by two different architectural types, artificial caves and communal Pueblos built in the open air.

"The ascent to the caves is tedious, for the slope is steep, and it is tiresome to clamber over the fragments of pumice and tufa that cover it. Once above we find ourselves before small doorways, both low and narrow, mostly irregularly oval. I measured a number of the cells and found their height to vary from 1.47 (4 feet 10 inches) to 2.03 m. (6 feet 8 inches.) Most of them, however, were over 5 feet high. The outer wall was usually 0.30m. thick like most of the Pueblo walls. I noticed little air-holes and also loop-holes in the outer walls, but no fire-places, although as Mr. Stevenson also observed, the evidences of fire are plain in almost every room. There is another locality of artificial cave-dwellings only three miles distant from Shu-finne called Pu-ye. It is also a mesa of pumice rock, and rows of pine partly cover the summit, and quite a large Pueblo ruin whose walls of pumice rise to a height of two stories and cover the top of the cliff. There was also a level platform all along the base of the vertical declivity, wide enough at one time to afford room for at least one cell if the rock were used as a rear wall. This rock is soft and friable, and can easily be dug into by means of sharp and hard substances, such as obsidian and flint. The volcanic formation of the mountain affords sufficient quantities of both materials, but chiefly of obsidian. Basalt chisels rudely made have also been found in connection with the caves. That the caves are wholly artificial admits of no doubt, and it was in fact easier for the Indian to scrape out his dwellings than to build the Pueblo whose ruins crown the summit of the cliff. Since Mr. J. Stevenson examined the Puye, in 1880, the locality has been frequently visited and but few specimens of broken objects are obtainable. I refer to the catalogue published by the Bureau of Ethnology for a description of the collections made on the spot by Mr. Stevenson in 1880. Mr. Eldodt has in his possession several valuable specimens from the Pu-ye. These relics have nothing to distinguish them from those found in Pueblo ruins in general, but the pottery is not so well decorated as that of Ojo Caliente and Rito Colorado. Fragments of a coarsely glazed variety are very abundant, and I know of but one specimen of incised ware found

CLIFF-HOUSES AT WALPI.

These houses are comparatively modern but illustrate the development of architecture; First, Cave-Houses; Second, Cliff-Dwellings; Third, Pueblos.



CLIFF-HOUSES ON THE SAN JUAN.

These houses were discovered by Mr. W. H. Holmes, in the San Juan Valley. They filled the niches in the rock but connected with one another and constituted an abode for a family or a clan.

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at or about the artificial caves. The vertical wall in which the caves have been excavated varies in height. In places it might be only six meters (twenty-five feet); in others it attains as many as sixteen (fifty feet.) The incline on the other hand is twenty meters (sixty-five feet), on the western and as many as fifty meters (one hundred and sixty feet) on the eastern end. As the denuded faces of the cliff are those of the south and east, it follows that the caves extend around it from the southwestern to the north-eastern corner, forming a row of openings along the base of the vertical wall. On the whole, the interior of these cells resembles that of a Pueblo room now of ancient type. There are even the holes where poles were fastened, on which hides, articles of dress, or dance ornaments were hung, as is still the custom of the Pueblo Indians. In one room I noticed what may have been a stone frame for the metates. The interior chambers may have been used for store-rooms, or the largest of them may have also served as dormitories. Every feature of a Pueblo household is found in connection with these caves. They form a pueblo in the rock, and there are also a number of estufas. The cave-houses and the highest Pueblo appear to have been in days long previous to the coming of the Europeans the homes of a portion of the Tehua tribe whose remnants now inhabit the village of Santa Clara. The country south of this interesting spot abounds in artificial caves. In nearly every gorge the cliffs show traces of such abodes. The country west of the Rio Grande in the vicinity of the Rito de los Frijoles abounds with caves which were abandoned at the time of the Spanish invasion. The cave dwellings of the Rito are very much like those already described. The caves themselves are poor in relics except those of the upper tiers. It appears that where the cliffs rise vertically, terraced houses were built using the rock for the rear wall.[*] These are one, two and even three stories high and leaned against the cliff. Sometimes the upper story consisted of a cave and the lower of a building."

The country west of the Rio Grande, in the vicinity of the Rito de los Frijoles is wild, with deep canyons traversing it like gashes cut parallel to each other from west to east. They are mostly several hundred feet in depth, and in places approaching a thousand. On the northern walls, facing the south or east, caves, usually much ruined are met with, in almost every one of them. There are also several pueblo ruins on the mesas, about which I have only learned from the Indians that they were Tehua villages, and that their construction, occupation and abandonment antedate perhaps by many centuries the times of Spanish colonization.

Another locality is mentioned by Mr. Bandelier and is illustrated by the plate.

Almost opposite San Idlefonso begins the deep and picturesque cleft through which the Rio Grande has forced its way. It is called "Canyon Blanco," "Canyon del Norte," or "White Rock Canyon." Towering masses of lava, basalt and trap form its eastern walls; while on the west these formations are capped, a short distance from the river, by soft pumice and tufa.

Major Powell also speaks of cave-houses which were constructed in the midst of the extinct craters of San Francisco mountain. He says:

"In the walls of this crater many caves are found, and here again a village was established, the caves in the scoria being utilized as habitations of men. These little caves were fashioned into rooms of more symmetry and convenience than originally found, and the openings of the caves were walled. Nor did these people neglect the gods, for in canyon and craters of this plateau were utilized in like munner as homes for tribal people, and in one cave far to the south a fine collection of several hundred pieces of pottery has been made."

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[*] The plate opposite page 30 accompanying this chapter illustrates the point. The Caves at Shufinne and the Cliff-Houses at Rio de Chelly have houses leaning against the Cliff.

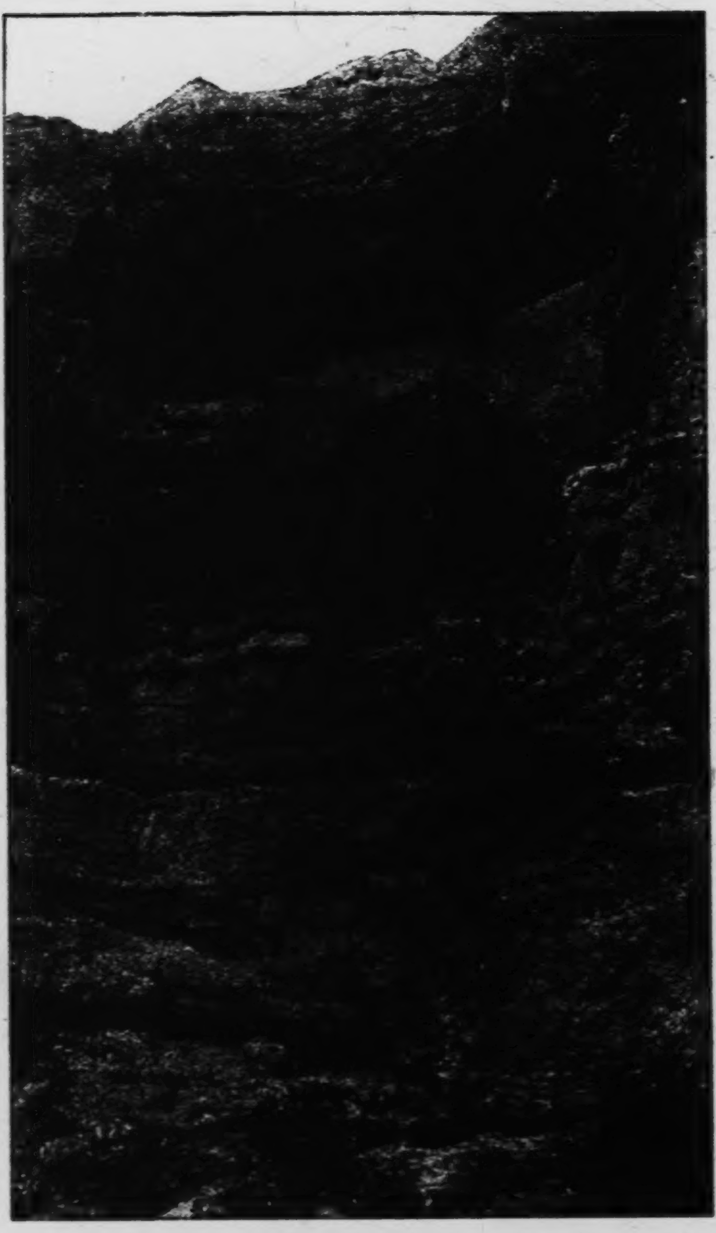
Major Powell speaks of Indians who built pueblos sometimes of the red sandstones in canyons and oftener of blocks of tufa. He says this material can be worked with great ease and with crude tools. Of the harder lava they cut out blocks and built pueblos two and three stories high. The blocks are usually 20 inches in length, 8 inches in width and 6 inches in thickness. These Indians left their pueblos on the plateau where the Navajo invasion came, and constructed cavate homes for themselves—that is they excavated chambers on the cliffs which were composed of tufa. On the face of the cliff hundreds of feet high and even miles in length, they dug out chambers with their stone tools, these chambers being little rooms eight or ten feet in diameter. Sometimes two or more such chambers connected. Then they constructed stairways in the soft rock, by which their cavate houses were reached; and in these rock shelters they lived during times of war. Mr. Mendeliff speaks of caves and cavate lodges which are near boulder sites, and old irrigating ditches on the Rio Verde and Limestone Creek. Here the almost entire absence of cliff-dwellings and the great abundance of cavate lodges is noticeable; the geographical formation being favorable to caves and unfavorable to cliff-dwellings, whereas on the Canyon de Chelly there are hundreds of cliff-dwellings and no cave-lodges. This is accounted for as an accident of environment where the conditions are reversed. He says:

"The relation of these lodges to the village ruins and the character of the sites occupied by them, supports the conclusion that they were farming out-posts, probably occupied only during the farming season according to the methods followed by many of the Pueblos today, and that the defensive motive had little or no influence on the selection of the site or the character of the structures. The boulder-marked sites and the small single-room remains illustrate other phases of the same horticultural methods, methods somewhat resembling the "intensive culture," of modern agriculture, but requiring further a close supervision or watching of the crop during the period of ripening. As the area of tillable land in the Pueblo region, especially in its western part is limited, these requirements have developed a class of temporary structures, occupied only during the farming season. In Tusayan, where the most primitive architecture of the Pueblo type is found, these structures are generally of brush; in Canon de Chelly they are cliff-dwellings; on the Rio Verde they are cavate lodges, boulder-marked sites and single house remains; but at Zuni they have reached their highest development in the three summer villages of Ojo Caliente, Nutria and Pescado."

Mr. Brandelier speaks of caves and cavate houses on the upper Gila and of others in Chihuahua. In both of these localities the region is wild and mountainous, just such as we would naturally expect to find occupied by cave-dwellers.

CAVATE HOUSES IN THE SHUFINNE.

CLIFF DWELLINGS ON THE RIO DE CHELLY



CLIFF FORTRESS ON THE RIO VERDE.

Description of this Cliff-Fortress is given on page 220.

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They resembled in this respect the home of the Troglodgytes in Europe.

Sacrificial caves, and spots sacred as shrines are quite numerous on, and about, Thunder Mountain, and a host of legends and folk tales cluster around the towering Table Rock. There are also pictographs and symbols near the caves and cliff-dwellings of the San Juan and the west of the Rio Grande; but these cave-lodges seem to be destitute of them, showing that they were only temporary places of refuge. Concealment was one object. The following is the description of the cavate houses on the Upper Gila:

> "These buildings occupy four caverns, the second of which towards the east is ten meters high. The western cave communicates with the others only from the outside, while the three eastern ones are separated by huge pillars behind which are natural passages from one cave to the other. The height of the floor above the bed of the creek is fifty-five meters, and the ascent is steep, in some places barely passable. To one coming from the mouth of the cliff the caves become visible only after he has passed them, so that they are well concealed. Higher up the several branches through whose union the Gila River is formed, cave-houses and cave-villages are not uncommon. Mr. Henshaw has published the description of one situated on Diamond Creek, to which description I refer. As the gorges become wilder and the expanses of tillable land disappear, the rocks and cliffs were resorted to as retreats and refuges. Whether the cave-dwellings and cliff-houses were occupied previous to the open-air villages along the Mimbres, or whether they were the last refuges of tribes driven from their homes in valley, it is of course not possible to surmise."

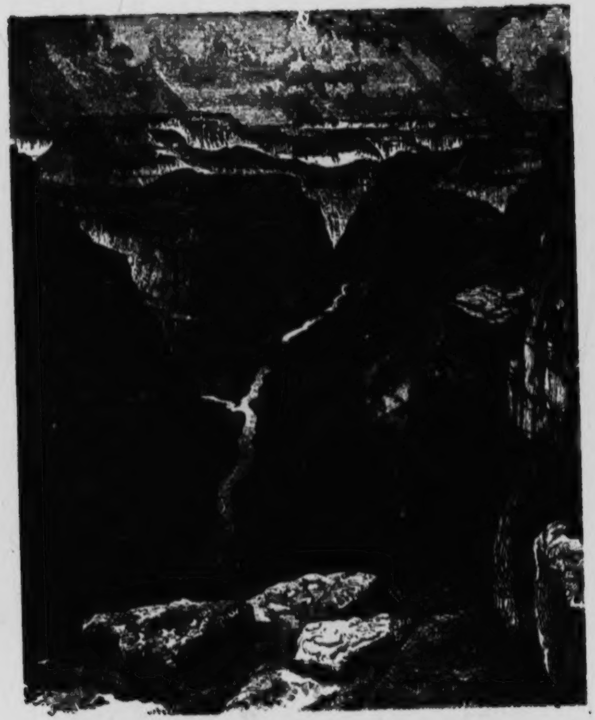
According to Mr. Bandelier the cave-dwellings are to be found as far south as the Casas Grandes in Chihuahua. There seems to have been a variety of structures, some of them very elaborate and bearing the type of architecture which is common in Mexico, others very rude, scarcely any better than that which the wild Indians would construct. The region is mountainous and so was occupied by different tribes, the Apaches having made it a resort. The following is a description of the locality:

> "The so-called Puerto de San Diego, a very picturesque mountain pass, ascends steadily for a distance of five or six miles. On its northern side rise towering slopes, the crests of which are overgrown with pines. In the south a ridge of great elevation terminates in crags and pinnacles. The trail winds upward in a cleft, and is bordered by thickets consisting of oak, smaller pines, cedars, mezcalagava and tall yucca. As we rise the view spreads out towards the southeast and east, and from the crest the plain below and the valley of Casas Grandes, with bald mountains beyond, appear like atopographical map. Turning to the west, a few steps carry us into lofty pine woods, where the view is shut in by stately trees surrounding us on all sides. The air is cool; deep silence reigns; we are in the solitudes of the eastern Sierra Madre. These mountains fastnesses are well adapted to the residence of small clusters of agricultural Indians seeking for security. I therefore neither saw nor heard of ruins of larger villages, but cave-dwellings were frequently spoken of. Some very remarkable ones are said to exist near the Piedras Verdes, about two day's journeying from Casas Grandes. I saw only the cave-dwellings on the Arroyo del Nombre de Dios, not far from its junction with the Arroyo de los Pilares. They lie about thirty-five to forty miles southwest of Casas-Grandes. The arroyo flows through a pretty vale lined on its south side by stately pines, behind

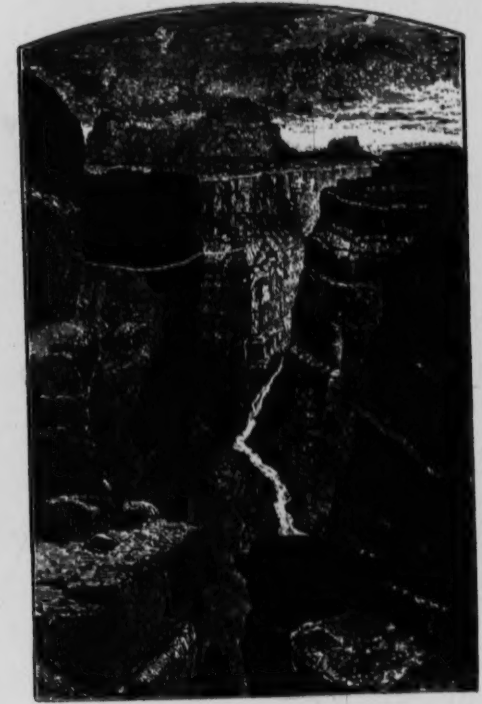
which picturesque rocks rise in pillars, crags and towers. The rock is a reddish breccia or conglomerate. Many caves, large and small, though mostly small, open in the walls of these cliffs, which are not high, measuring nowhere over two hundred feet above the level of the valley. The dwellings are contained in the most spacious of these cavities, which lie about two miles from the outlet of the arroyo. They are so well concealed that, along the banks of the stream, it is easy to pass by without seeing them.

The point which we make is this, that while the cliff-dwellings differ from the cavate lodges in many respects yet they are in the strongest contrast with the European caves while they belong to the same age with the lake-dwellings and the towers and nirhages,and show about the same style of architecture, and exhibit the same grade of advancement and prove the position which was taken at the outset, that the cliff-dwellers marked one extreme of social progress and the cave-dwellers or troglodytes of Europe marked the other, and the whole series of prehistoric structures and relics may be embraced between them.

We see from this that the caves and cave-houses and cliff-dwellings were widely distributed and numerous, but they differ very materially from the caves of Europe. If there were no other proof of this it would be enough to examine the cut which represent the cliff-dwellings situated in the Canyon de Chelley, and compare it with the cuts which represent the caves of Europe. This cliff-dwelling was first discovered by Lieut J. H. Simpson in 1849 and has been often visited and described by other explorers. It well represents its class. If we take the series of cuts given with this paper and compare the caves of Europe on one side with the cavate lodges and the cliff-dwellings on the other, we shall find the difference between the European caves and the cliff-dwelings in America.



THE COLORADO RIVER.



BRINK OF THE INNER GORGE.

MUKUNTUWEAP CANYON.

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# CHAPTER III.

## THE HOME OF THE CLIFF-DWELLERS.*

There are two distinct portions of the basin of the Colorado, a desert portion below and a plateau above. The lower third, or desert portion of the basin, is but little above the level of the sea, though here and there, ranges of mountains rise to an altitude of from 3,000 to 6,000 feet. This part of the valley is bounded on the northeast by a line of cliffs which present a bold, often vertical step, hundreds or thousands of feet, to the table lands above. On the California side a vast desert stretches westward, past the head of the Gulf of California, nearly to the shore of the Pacific. Between the desert and the sea a narrow belt of valley, hill, and mountain of wonderful beauty is found. Over this coastal zone there falls a balm distilled from the great ocean, as gentle showers and refreshing dews bathe the land. When rains come the emerald hills laugh with delight as bourgeoning bloom is spread in the sunlight. When the rains have ceased all the verdure turns to gold. Then slowly the hills are brinded until the rains come again, when verdure and bloom again peer through the tawny wreck of last years's greenery. North of the Gulf of California the desert is known as "Coahuila Valley," the most desolate region on the continent.

On the Arizona side of the river, desert plains are interrupted by desert mountains. Far to the eastward the country rises until the Sierra Madre are reached in New Mexico, where these mountains divide the waters of the Colorado from the Rio Grande del Norte. Here in New Mexico the Gila River has its source. Some of its tributaries rise in the mountains to the south, in the territory belonging to the Republic of Mexico; but the Gila gathers the greater part of its waters from a great plateau on the northeast. Its sources are everywhere in pine-clad mountains and plateaus, but all of the affluents quickly descend into the desert valley below, through which the Gila winds its way westward to the Colorado. In times of continued drought the bed of the Gila is dry, but the region is subject to great and violent storms, and floods roll down from the heights with marvelous precipitation, carrying devastation on their way.

Where the Colorado River forms the boundary between California and Arizona it cuts through a number of volcanic rocks by black, yawning cañons. Between these cañons the river has a low but rather narrow flood plain, with cottonwood groves scattered here and there, and a chaparral of mesquite, bearing beans and thorns.

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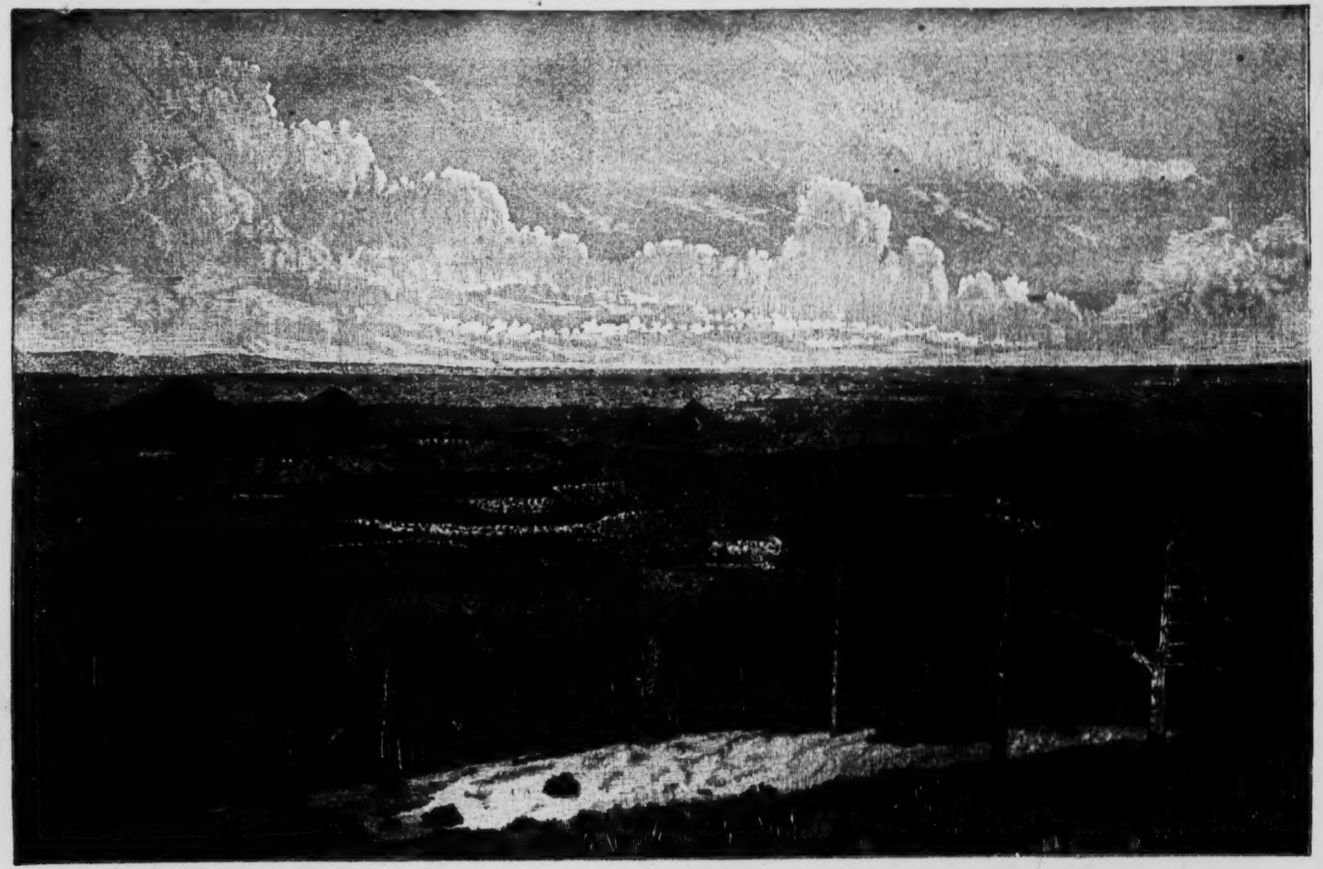
*This chapter was written by Major J. W. Powell, and first printed in the Canyons of the Colorado.

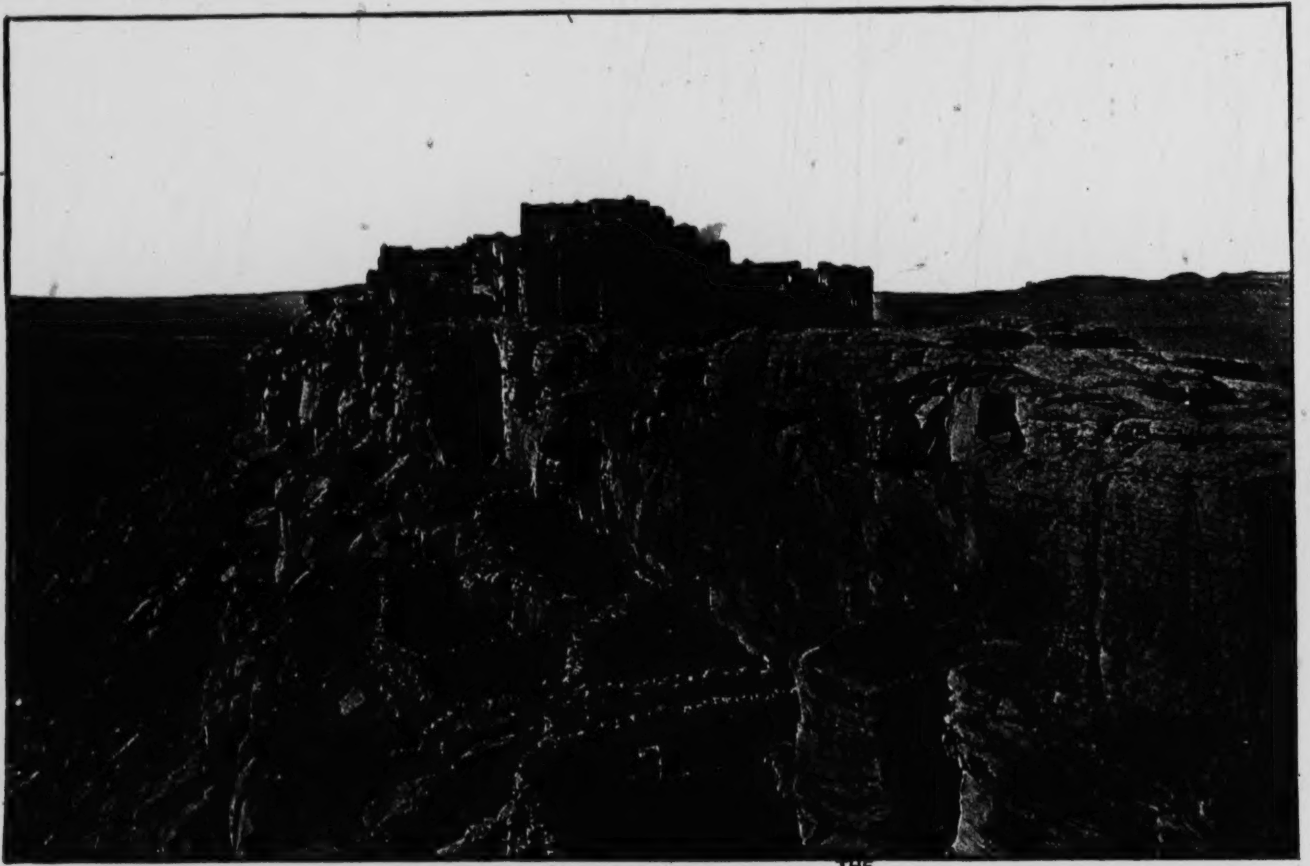
The region of country lying on either side of the Colorado for 600 miles of its course above the gulf, stretching to Coahuila Valley below on the west, and to the highlands, where the Gila heads, on the east, is one of singular characteristics. The plains and valleys are low, arid, hot, and naked, and the volcanic mountains scattered here and there are lone and desolate. During the long months the sun pours its heat upon the rocks and sands, untempered by clouds above or forest shades beneath. The springs are so few in number that their names are household words in every Indian rancheria, and every settler's home; as there are no brooks, no creeks, and no rivers but the trunk of the Colorado and the trunk of the Gila.

The desert valley of the Colorado, which has been described as distinct from the plateau region above, is the home of many Indian tribes. Away up at the sources of the Gila, where the pines and cedars stand, and where creeks and valleys are found, is a part of the Apache land. These tribes extend far south into the Republic of Mexico. The Apaches are intruders in this country, having at some time, perhaps many centuries ago, migrated from British America. They speak the Athapascan language. The Apaches and Navajos are the American Bedouins. On their way from the far north they left several colonies in Washington, Oregon, and California. They came to the country on foot, but since the Spanish invasion they have become skilled horsemen. They are wily warriors and implacable enemies, feared by all other tribes. They are hunters, warriors, and priests, these professions not yet being differentiated. The cliffs of the region have many caves, in which these people perform their religious rites. The Sierra Madre formerly supported abundant game, and the little Sonora deer was common. Bears and mountain lions were once found in great numbers, and they put the courage and prowess of the Apaches to a severe test. Huge rattlesnakes are common, and the rattlesnake god is one of the deities of the tribes.

The low desert, with its desolate mountains, which has thus been described, is plainly separated from the upper region of plateau by the Mogollon Escarpment, which, beginning in the Sierre Madre of New Mexico, extend northwestward across the Colorado far into Utah, where it ends on the margin of the great basin. See Plate.

The rise by this escarpment varies from 3,000 to more than 4,000 feet. The step from the lowlands to the highlands, which is here called the Mogollon Escarpment, is not a simple line of cliffs, but is a complicated and irregular façade presented to the southwest. Its different portions have been named by the





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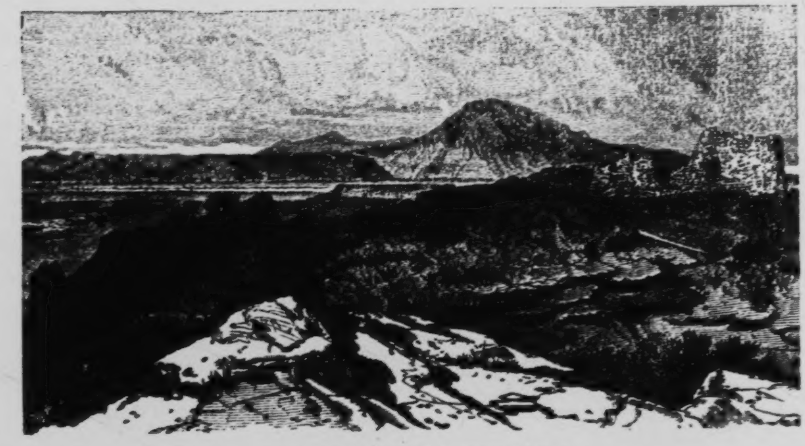
THE VILLAGE OF WALPI.

people living below, as distinct mountains, as Shiwits Mountains, Mogollon Mountains, Pinal Mountains, Sierra Calitro, etc., but they all rise to the summit of the same great plateau region.

This high region on the east, north and west, is set with ranges of snow-clad mountains attaining an altitude above the sea varying from 8,000 to 14,000 feet. All winter long snow falls on its mountain-crested rim, filling the gorges, half burying the forests, and covering the crags and peaks with a mantle woven by the winds from the waves of the sea. When the summer sun comes this snow melts and tumbles down the mountain sides in millions of cascades. A million cascade brooks unite to form a thousand torrent creeks; a thousand torrent creeks unite to form half a hundred rivers beset with cataracts; half a hundred roaring rivers unite to form the Colorado, which rolls, a mad, turbid stream, into the Gulf of California. Consider the action of one of these streams. Its source is in the mountains, where the snow falls; its course through the arid plains. Now, if at the river's flood, storms were falling on the plains, its channel would be cut but little faster than the adjacent country would be washed, and the general level would thus be preserved; but under the conditions here mentioned the river continually deepens its beds; so all the streams cut deeper and still deeper, until their banks are towering cliffs of solid rock. These deep, narrow gorges are called cañons. For more than a thousand miles along its course the Colorado has cut for itself such a cañon; but at some few points, where lateral streams join it, the cañon is broken and these narrow, transverse valleys divide into a series of cañons. The Virgen, Kanab, Paria, Escalante, Fremont, San Rafael, Price and Uinta on the west, the Grand, White, Yampa, San Juan and Colorado Chiquito on the east, have also cut for themselves such narrow, winding gorges, or deep cañons. Every river entering these has cut another canyon; every lateral creek has cut a cañon; every brook runs in a cañon; every rill born of shower and born again of a shower and living only during these showers, has cut for itself a cañon; so that the whole upper portion of the basin of the Colorado is traversed by a labyrinth of these deep gorges.

After the cañons, the most remarkable features of the country are the long lines of cliffs. These are bold escarpments scores or hundreds of miles in length,—great geographic steps, often hundreds or thousands of feet in altitude, presenting steep faces of rock, often vertical. Having climbed one of these steps, you may descend by a gentle, sometimes imperceptible, slope to the foot of another. They thus present a series of terraces, the steps of which are well defined escarpments of rock. The lateral extension of such a line of cliffs is usually very irregular; sharp salients are projected on the plains below, and deep recesses are cut into the terraces above. Intermittent streams coming down the cliffs have cut many cañons or cañon villages, by which the traveler may pass from the plain below to the terrace above. By these gigantic stairways he may ascend to high plateaus, covered with forests of pine and fir.

From the Grand Cañon of the Colorado a great plateau extends southeastward through Arizona nearly to the line of New Mexico, where this elevated land merges into the Sierra Madre. The general surface of this plateau is from 6,000 to 8,000 feet above the level of the sea. Various tributaries of the Gila have their sources in this escarpment, and before entering the desolate valley below they run in beautiful cañons which they have carved for themselves in the margin of the plateau. Sometimes these cañons are in the sandstones and limestones, which constitute the platform of the great elevated region called the San Francisco Plateau. The escarpment is caused by a fault, the great block of the upper side being lifted several thousand feet above the valley region. Through the fissure lavas poured out, and in many places the escarpment is concealed by sheets of lava. The cañons in these lava beds are often of great interest. On the plateau a number of volcanic mountains are found, and black cinder cones are scattered in profusion.



*Ruins at the Head of McElmo Canyon.*

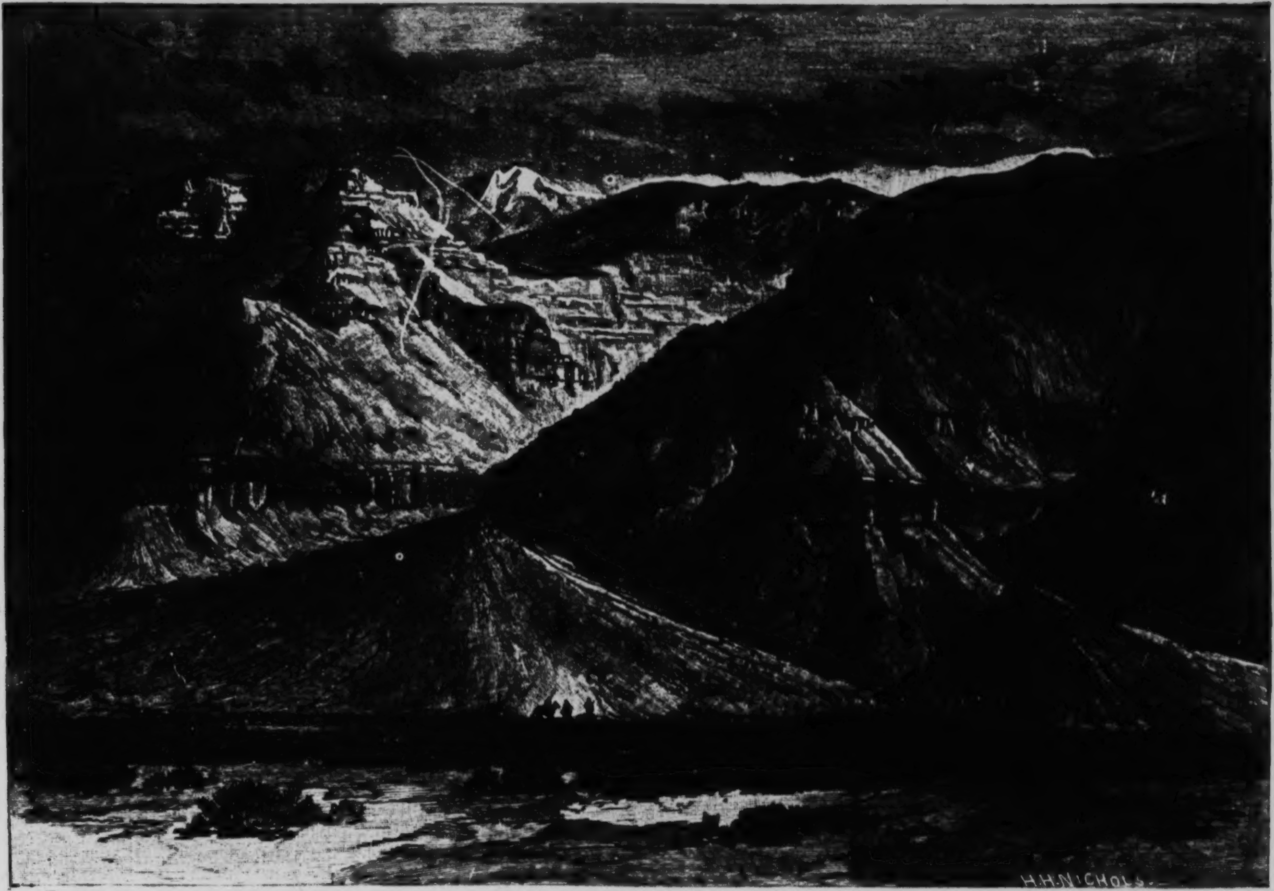
Through the forest lands are many beautiful prairies and glades that in midsummer are decked with gorgeous wild flowers. The rains of the region give source to few perennial streams, but intermittent streams have carved deep gorges in the plateau, so that it is divided into many blocks. The upper surface, although forest clad and covered with beautiful grasses, is almost destitute of water. A few springs are found; but they are far apart, and some of the volcanic craters hold lakelets. The limestone and basaltic rocks sometimes hold pools of water; and where the basins are deep the waters are perennial. Such pools are known as "water pockets."

This is the great timber region of Arizona. Not many years ago it was a vast park for elk, deer, antelope and bears, and mountain lions were abundant. This is the last home of the wild turkey in the United States, for they are still found here in great numbers. San Francisco Peak is the highest of these volcanic mountains, and about it are grouped in an irregular way many volcanic cones, one of which presents some remarkable characteristics. A portion of the cone is of bright reddish cinders, while the adjacent rocks are of black basalt. The contrast in the colors is so great that on viewing the mountain from a distance the red cinders seem to be on fire. From this circumstance the cone has been named Sunset Peak. When distant from it ten or twenty miles it is hard to believe that the effect is produced by contrasting colors, for the peak seems to glow with a light of its own. A few miles south of San Francisco Peak there is an intermittent stream known as Walnut Creek. This stream runs in a deep gorge, 600 to 800 feet below the general surface. The stream has cut its way through the limestone and through a series of sandstones, and bold walls of rock are presented on either side. East of San Francisco Peak there is another low volcanic cone, composed of ashes which have been slightly cemented by the processes of time, but which can be worked with great ease. On this cone another tribe of Indians made its village. For the purpose they sunk shafts into the easily worked, but partially consolidated ashes, and after penetrating from the surface three or four feet they enlarged the chambers so as to make them ten or twelve feet in diameter. In such a chamber they made a little fire-place, its chimney running up on one side of the well-hole by which the chamber was entered. Often they excavated smaller chambers connected with the larger, so that sometimes two, three, four or even five smaller connecting chambers are grouped about a large central room. The arts of these people resembled those of the people who dwelt in Walnut cañon. One thing more is worthy of special notice. On the very top of the cone they cleared off a space for a court-yard, or assembly square, and about it they erected booths, and within the square a space of ground was prepared with a smooth floor, on which they performed the ceremonies of their religion and danced to the gods in prayer and praise.

The Little Colorado is a marvelous river. In seasons of great rains it is a broad but shallow torrent of mud; in seasons of drought it dwindles, and sometimes entirely disappears along portions of its course. The upper tributaries usually run in beautiful box cañons. Then the river flows through a low, desolate, bad-land valley, and the river of mud is broad but shallow, except in seasons of great floods. But fifty miles or more above the junction of this stream with the Colorado River proper, it plunges into a cañon with limestone walls, and steadily this cañon increases in depth, until, at the mouth of the stream, it has walls more than 4,000 feet in height. This valley of the Little Colorado is also the site of many ruins, and the villages or towns found in such profusion were of much larger size than those on the San Francisco Plateau. Some of the pueblo-building peoples still remain. The Zuni Indians still occupy their homes, and they prove to be a most interesting people. They have cultivated the soil from time immemorial. They build their houses of stone, and line them with plaster; and they have many interesting arts, being skilled potters and deft weavers. The seasons are about equally divided between labor, worship, and play.

A hundred miles to the northwest of the Zuni pueblo are the seven pueblos of Tusayan: Oraibi, Shumopavi, Shupaulovi, Mashongnavi, Sichumovi, Walpi, and Hano. These towns are built on high cliffs. The people speak a language radically different from that of the Zuni, but, with the exception of that of the inhabitants of Hano, closely allied to that of the Utes. The people of Hano are Tewans, whose ancestors moved from the Rio Grande to Tusayan during the great Pueblo revolt against Spanish authority in 1680–96. In these mountains, plateaux, mesas, and cañons, the Navajo Indians have their home. The Navajos are intruders in this country. They belong to the Athapascan stock of British America and speak an Athapascan language, like the Apaches of the Sierra Madre country. They are a stately, athletic, and bold people. While yet this country was a part of Mexico they acquired great herds of horses and flocks of sheep, and lived in opulence compared with many of the other tribes of North America.

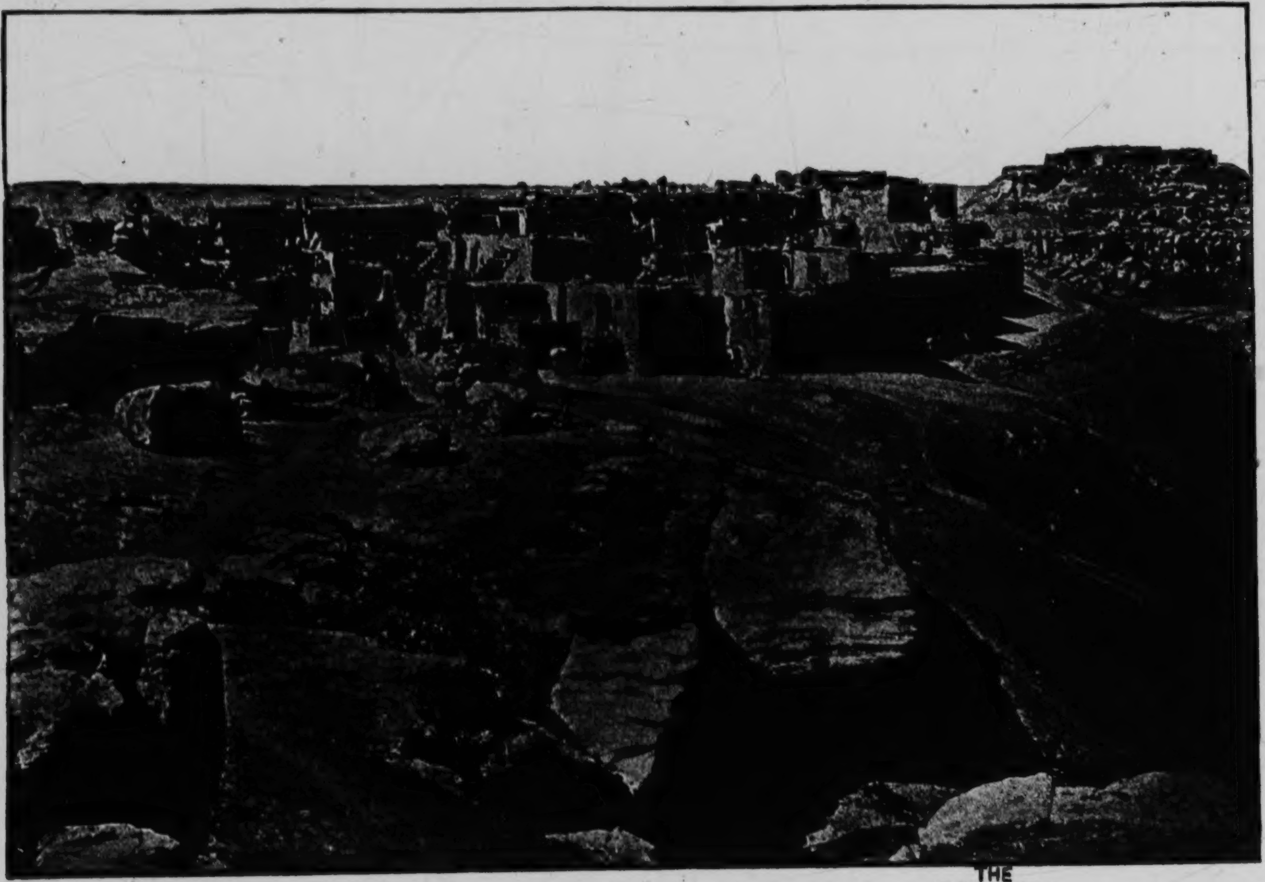
Perhaps the most interesting ruins of America are found in this region. The ancient pueblos found here are of superior structure, but they were all built by a people whom the Navajos displaced when they migrated from the far north. Wherever there is water, near by an ancient ruin may be found, and these ruins are gathered about centers, the centers being larger pueblos and the scattered ruins representing single houses. The ancient people lived in villages, or pueblos, but during the growing season they scattered about by the springs and streams to cultivate the soil by irrigation, and wherever there was a little farm or garden patch, there was built a summer house of stone. When times of war came, especially when they were invaded by the Navajos, these ancient people left their homes in the pueblos and by the streams, and constructed temporary homes in the cliffs and cañon walls. Such cliff ruins are abundant throughout the region. Ultimately the ancient pueblo peoples suc-



MOGOLLON ESCARPMENT.

From "Canyons of the Colorado."

Flood & Vincent, Meadville, Pa.



MASHANGNAVI WITH SHUPAULAVI IN THE DISTANCE.

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cumbed to the prowess of the Navajos and were driven out. A part joined related tribes in the valley of the Rio Grande; others joined the Zuni and the people of Tusayan; and still others pushed on beyond the Little Colorado to the San Francisco Plateau and far down into the valley of the Gila.

Farther to the east, on the border of the region which we have described, beyond the drainage of the Little Colorado and San Juan and within the drainage of the Rio Grande, there lies an interesting plateau region, which forms a part of the Plateau Province and which is worthy of description. This is the great Tewan Plateau, which carries several groups of mountains. The plateau itself is intersected with many deep, narrow cañons, having walls of lava, volcanic dust, or tufa, and red sandstone. It is a beautiful region. The low mesas on every side are almost treeless and are everywhere deserts, but the great Tewan Plateau is booned with abundant rains, and it is thus a region of forests and meadows, divided into blocks by deep and precipitous canyons and crowned with cones that rise to an altitude of from 10,000 to 12,000 feet. For many centuries the Tewan Plateau, with its cañons below and its meadows and forests above, has been the home of tribes of Tewan Indians, who built pueblos, sometimes of red sandstones, in the cañons, but often of blocks of tufa, or volcanic dust. This light material can be worked with great ease, and with crude tools of the harder lavas they cut out blocks of the tufa and with them built pueblos two or three stories high. The blocks are usually about twenty inches in length, eight inches in width and six inches in thickness, though they vary somewhat in size. On the volcanic cones which dominate the country these people built shrines and worshiped their gods with offerings of meal and water and with prayer and symbols made of the plumage of the birds of the air.

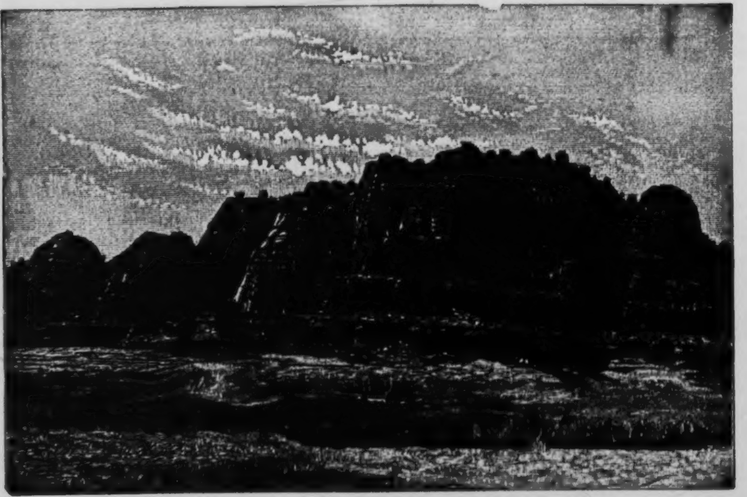
When the Navajo invasion was long past, civilized men, as Spanish invaders, entered this country from Mexico, and again the Tewan people left their homes on the mesas and by the cañons to find safety in the cavate dwellings of the cliffs; and now the archæologist in the study of this country discovers these two periods of construction and occupation of the cave dwellings of the Tewan Indians.

To the east of this plateau region, with its mesas and buttes and its volcanic mountains, stand the southern Rocky Mountains, or Park Mountains, a system of north and south ranges. These ranges are huge billows in the crust of the earth, out of which mountains have been carved. The parks of Colorado are great valley basins enclosed by these ranges and over their surfaces moss agates are scattered. The mountains are covered with dense forests and are rugged and wild. The higher peaks rise above the timber line and are naked gorges of rocks. In them the Platte and Arkansas rivers head and flow eastward to join the Missouri river. Here also heads the Rio Grande del Norte, which flows southward into the Gulf of Mexico, and still to the west head many streams which pour into the Colorado waters, destined to the Gulf of California. Throughout all this region drained by the Grand, White, and Yampa rivers, there are many beautiful parks. The great mountain slopes are still covered with primeval forests. Springs, brooks, rivers, and lakes abound, and the waters are filled with trout. Not many years ago the hills were covered with game—elks on the mountains, deer on the plateaus, antelope in the valleys, and beavers building their cities on the streams. The plateaus are covered with low, dwarf oaks and many shrubs bearing berries, and in the chaparral of this region cinnamon bears are still abundant. From time immemorial the region drained by the Grand, White and Yampa rivers has been the home of Ute tribes of the Shoshonean family of Indians. These Indians built their shelters of boughs and bark, and to some extent lived in tents made of the skins of animals. They never cultivated the soil, but gathered wild seeds and roots and were famous hunters and fishermen. As the region abounds in game, these tribes have always been well clad in skins and furs. The men wore blouses, loincloth, leggins and moccasins, and the women dressed in short kilts. It is curious to notice the effect which the contact of civilization has had upon these women's dress. Even twenty years ago they had lengthened their skirts, and dresses made of buckskin, fringed with furs and beaded with elk teeth were worn so long that they trailed on the ground. Neither men nor women wore any head dress except on festival occasions for decorations, then the women wore little basket bonnets decorated with feathers, and the men wore headdresses made of the skins of ducks, geese, eagles, and other large birds. Sometimes they would prepare the skin of the head of the elk or deer, or of a bear or mountain lion or wolf, for a head dress. For very cold weather both men and women were provided with togas for their protection. Sometimes the men would have a bearskin or elkskin for a toga; more often they made their togas by piecing together the skins of wolves, mountain lions, wolverines, wild cats, beavers and otters. The women sometimes made theirs of fawnskins, but rabbitskin robes were far more common. These rabbitskins were tanned with the fur on and cut into strips, then cords were made of the fiber of wild flax or yucca plants and round these cords the strips of rabbitskin were rolled so that they made long ropes of rabbitskin coils with a central cord of vegetal fiber.

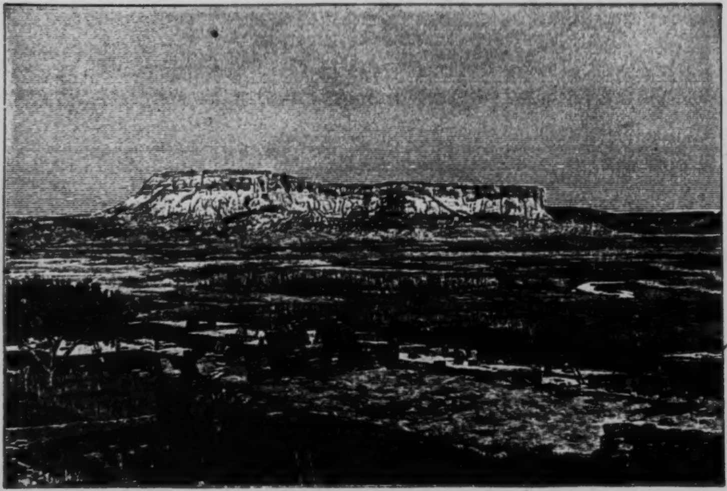
The Ute Indians, like the Indians of North America, have a wealth of mythic stories. The heroes of these stories are the beasts, birds and reptiles of the region, and the themes of the stories are the doings of these mythic beasts—the ancients from

PA-RUN-U-WEAP CANYON.

*From "Canyons of the Colorado."* *Flood & Vincent, Meadville, Pa.*



CLIFF NEAR FORT WINGATE.



TOYALONE CLIFF, NEAR ZUNI.

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whom the present animals have descended and degenerated. The primeval animals were wonderfnl beings, as related in the the lore of the Utes. They were the creators and controllers of all the phenomena of nature known to these simple-minded people. The Utes were zoötheists. Each little tribe has its Shaman, or medicine man, who is the historian, priest and doctor. The lore of this Shaman is composed of mythic tales of ancient animals.

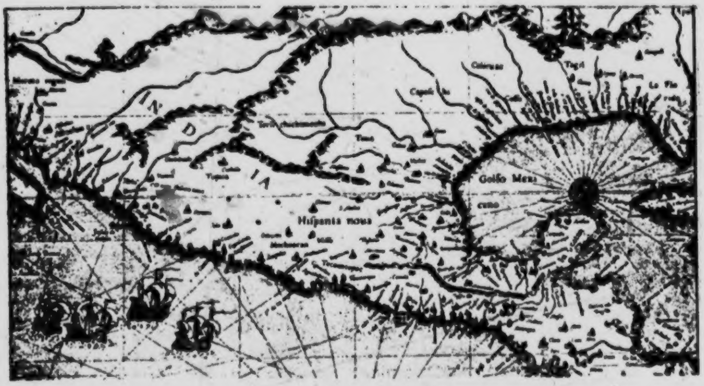
The Indians are skillful actors and they represent the parts of beasts or reptiles, wearing masks and imitating the ancient zoic gods. In temples walled with gloom of night and illumed by torch fires the people gather about their Shaman, who tells and acts the stories of creation recorded in their traditional bible. When fever prostrates one of the tribe the Shaman gathers the actors about the striken man and with wierd dancing, wild ululation and ectatic exhortation the evil spirit is driven from the body. Then they have their ceremonies to pray for the forest fruits, for abundant game, for successful hunting and for prosperity in war.

The stupendous cliffs by which the plateaus are bounded are are of indescribable grandeaur and beauty. The cliffs bounding the Kaibab plateau descend on either side and this is the cultimating portion of the region. All the other plateaus are terraces, with cliffs ascending on the one side and descending on the other. Some of the tables carry dead volcanoes on their backs that are towering mountains, and all of them are dissected by canyons that are gorges of profound depth. But every one of these plateaus has characteristics peculiar to itself and is worthy of its own chapter. On the north there is a pair of plateaus, twins in age but very distinct in development, the Paunsagunt and Markagunt. They are separated by the Sevier river, which flows northward.

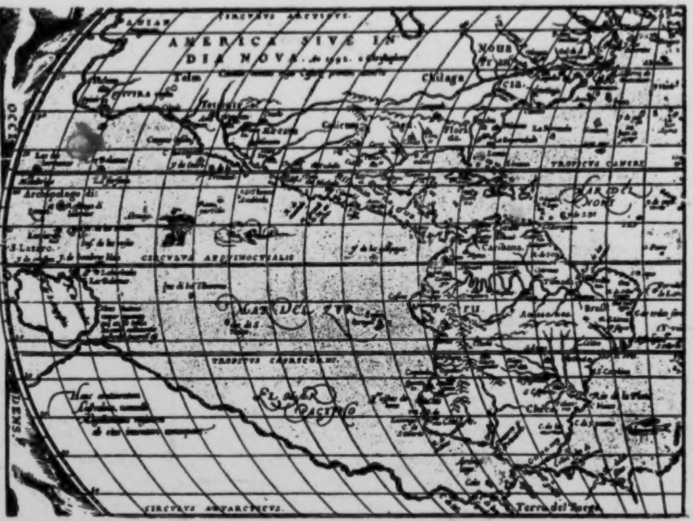
On the terraced plateaus three tribes of Indians are found: The Shiwits ("the people of the springs"), the Uinkarets ("people of the pine mountains"), and the Unkakaniguts ("people of the red lands, who dwell along the Vermilion cliffs"). They are all Utes, and belong to a confederacy with other tribes living farther to the north, in Utah. These people live in shelters made of boughs piled up in circles and covered with juniper bark, supported by poles. These little houses are only large enough for half a dozen persons huddling together in sleep. Their aboriginal clothing was very scant, the most important being wild cat skin and wolf skin robes for the men, and rabbit skin for the women, though for occasions of festival they had clothing of tanned deer and antelope skins, often decorated with fantastic ornaments of snake skins, feathers, and the tails of squirrels and chipmunks. A great variety of seeds and roots furnish their food, and on higher plateaus there is much game, especially deer and antelope. But the whole country abounds with rabbits, which are often killed with arrows and caught in snares.

Every year they have great hunts, when scores of rabbits are killed in a single day. It is managed in this way: They make nets of the fiber of the wild flax and of some other plant, the meshes of which are about an inch across. These nets are about three and one-half feet in width and hundreds of yards in length.

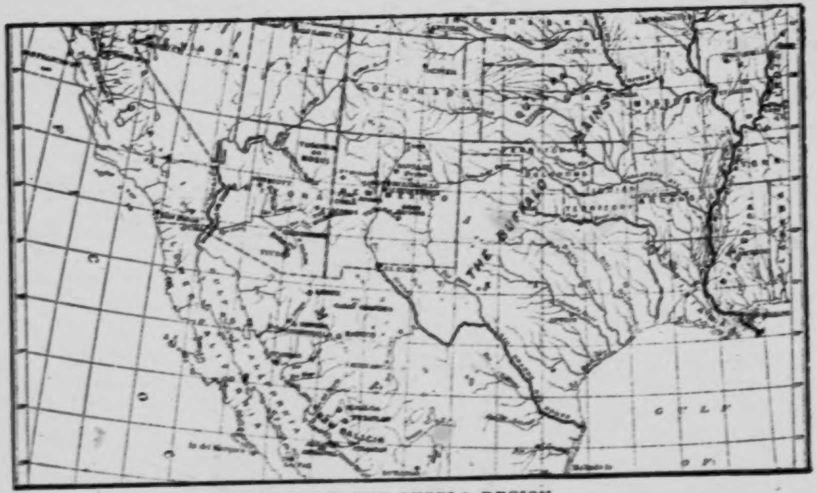
The Kanab River, heading in the pine cliffs, runs directly southward and joins the Colorado in the heart of the Grande Cañon. Its way is through a series of cañons. From one of these it emerges at the foot of the Vermilion cliffs, and here stood one extensive ruin not many years ago. Some portions of the pueblo were three stories high. The structure was one of the best found in this land of ruins. The Mormon people settling here have used the stones of the old pueblo in building their homes, and now no vestiges of the ancient structure remain. A few miles below the town other ruins were found. They were scattered to Pipe's Springs, a point twenty miles to the westward. Ruins were also discovered up the stream as far as the Pink cliffs, and eastward along the Vermilion cliffs nearly to the Colorado River, and out on the margin of the Kanab plateau. These were all ruins of outstanding habitations belonging to the Kanab pueblo. From the study of the existing pueblos found elsewhere, and from extensive study of the ruins, it seems that everywhere tribal pueblos were built of considerable dimensions, usually to give shelter to several hundred people.


INDIA
Hispania noua
Golfo Mex
Tagil
Colima

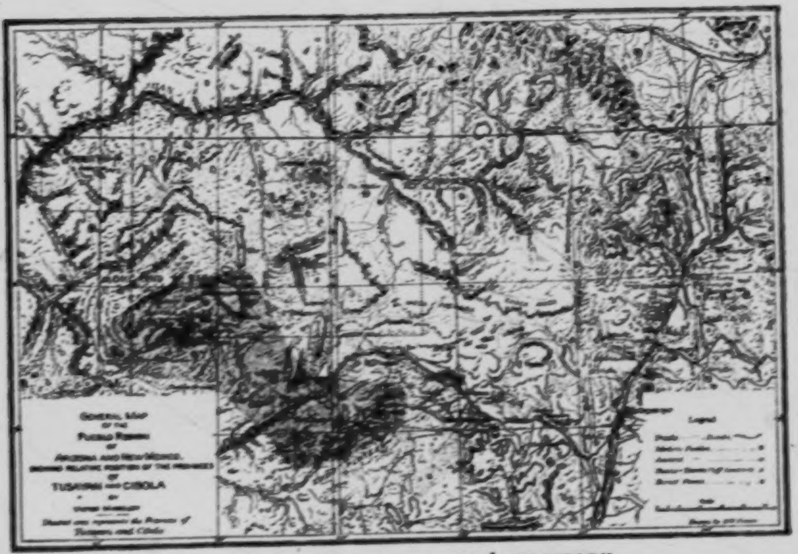
ORTELIUS' MAP OF THE NEW WORLD.


CIRCVLVS ARCTICVS
AMERICA SIVE INDIA NOVA
Chilaga
Noua Francia
Quivira
S. Lazaro
CIRCVLVS AEQVINOCTIALIS
TROPICVS CANCRI
MAR DEL ZVR
MAR DEL NORT
Peru
Amazones
Brasil
TROPICVS CAPRICORNI
EL MAR PACIFICO
Chili
Rio de la Plata
CIRCVLVS ANTARCTICVS
Terra del Fuego

MERCATOR'S MAP OF AMERICA.


THE BUFFALO PLAINS
GULF

MAP OF THE PUEBLO REGION.


General Map
of the
Pueblo Region
of
Arizona and New Mexico.
Showing relative position of the provinces
of
Tusayan and Cibola
Legend

MAP OF THE CLIFF-DWELLERS' TERRITORY.

# CHAPTER IV.

## THE DISCOVERY OF THE PUEBLOS.

In writing the history of the explorations which led to the discovery of the pueblos and cliff-dwellings, we shall have to go back to the time when Narvaez was wrecked upon the Florida coast. This occurred in the year 1528, near Tampa Bay. Those of the party who were not drowned remained on an island or on the mainland for six years, and endured from the Indians the greatest indignities. At length, four of them—three Spaniards and a negro—under the lead of Cabeca de Vaca, escaped, and took their flight towards the mountains of Northern Alabama.[*] Thence their course was westerly across the Mississippi, "the great river coming from the north," across the Arkansas River to the headwaters of the Canadian, and thence southwesterly through New Mexico and Arizona to Culiacan, or Sonora, which they reached in the spring of 1536. Culiacan was a province which had been visited by the Spaniards under Nuno de Guzman, and a colony settled there.[†] When these fugitives arrived at Culiacan they told marvelous stories concerning the things which they had seen and heard; and, among other things, they mentioned the great and powerful cities, which contained houses of four and five stories, thus confirming the report of the Indian slave. When these tales were communicated to the new governor, Francisco Vasquez de Coronado, in his home in Mexico, he set out with haste to the province of Culiacan, taking with him three Franciscan friars,[‡] whom he dispatched with the negro Estevanico on a journey of discovery, with orders to return and report to him all they could ascertain about the "seven celebrated cities." The monks, when they came near the province, sent the negro in advance The negro, however, as soon as he reached the country of the "seven cities of Cibola," demanded not only their wealth, but their women. The inhabitants, not relishing this, killed him and sent back all those who had accompanied him.[§] This disheartened the monks, and they returned to Culiacan; but in their report to Coronado they gave a glowing description of all that had been discovered of the seven cities, as well as of the "islands filled with treasure, which they were assured existed in the Southern Sea."

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[*] The names of the Spaniards were Alvar Nunez, Cabeca de Vaca, Andres Dorantes and Alonzo del Castillo Maldonado, and that of the negro was Estevanico (Stephen).

[†] "The occasion of visiting this province was the report which was brought by an Indian, a slave, that there were somewhere north of Mexico, cities, seven in number, as large as the City of Mexico itself, whose streets were exclusively occupied by workers in gold and silver; and to reach them a journey of forty days through a desert was required."

The towns of Compostella, Culiacan, Cinaloa, and Sonora are laid down on the military map of the United States and as given in the map by General Simpson, are placed along the east coast of the Gulf of California.

[‡] The name of one of the priests was Marcos de Nica, commonly called Friar Marcos. Castaneda's Relations are the sources of information about the journey.

[§] The place which the monks visited and where the negro was killed has been identified by F. W. Hodge. See American Anthropologist.

Arriving at Mexico, the friars proclaimed, through their pulpits, the marvelous discoveries, and Coronado busied himself with preparing an expedition to the region. Many gentlemen of good family were enlisted, and probably there had not been an expedition in which there was such a large proportion of persons of noble birth. It was also arranged that two vessels should take supplies and follow the army along the coast of the "Southern Sea." The army reached Culiacan, which was the last town inhabited by the Spaniards, and was two hundred and ten leagues from the City of Mexico. After resting a couple of weeks, Coronado led the advance of his army, consisting of fifty cavaliers, a few infantry, his particular friends and the monks, leaving the rest of the army to follow two weeks after. Passing out of the inhabited region, he came at the edge of a great desert, to a place called Chichilticale, and could not suppress his sadness at what he saw. The place of which so much had been boasted was only a ruined, and roofless house, which at one time seemed to have been fortified and was built of red earth.*

In this connection it may be interesting to give an account of the discovery of the Rio Colorado. It will be remembered that the vessels were ordered to follow the march of the army along the coast of the Southern Sea. The vessels put to sea from La Nativitad on May 9, 1540. They put into the ports of Xalisco and Culiacan, but finding Coronado and his army gone, they sailed northwardly until they entered the Gulf of California, which they experienced great difficulty in navigating. After incredible hardships they managed to get the vessels to the end of the gulf, where they found "a very great river, and the current of which was so rapid that they could scarcely stem it." Taking two shallops with some guns they commenced the ascent of the river by hauling the boats with ropes.†

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*This was the work of civilized people who had "come from afar." It has been thought by some to be Casa Grande on the Gila—a building which is far famed because it represents one class of structures which was common in this region and was supposed to have belonged to the ancient Pima Indians, who formerly built pueblos, but of a different type from those which were inhabited by the Moquis and Zunis. Mr. A. F. Bandelier thinks that the red house may possibly have been Casa Grande, though the ruin is perfectly white at present. He says that this kind of village includes a much larger and more substantial structure. It grows more conspicuous as we ascend the course of the Otonto Creek. It consists of a central building, into which, in some cases, all the buildings are merged; sometimes enclosed by broad quadrangular walls, while transverse walls connect the enclosure with a central hill. In some cases there are indications that the house was erected on an artificial platform. He says that the Pimas claim all the ruins north of the Gila to the "Superstition Range" as those of their own people.

†The region at the mouth of the Colorado is a flat expanse of mud, and the channels at the entrance from the gulf are shifting and changeable. The navigation is rendered periodically dangerous by the strength of the spring tides. Fort Yuma is 150 miles from the mouth, and to this point the principle obstructions are sand bars. Above Fort Yuma for 180 miles the river passes through a chain of hills and mountains, forming gorges and canons. There are many swift rapids and dangerous sunken rocks. The Black Canon is twenty-five miles long.

The general, Fernando Alarcon, reached a point on the river as far north as about the 34°, where he planted a cross and deposited letters at the foot of a tree, which were afterwards found by Melchior Diaz.* This discovery of the Gulf of California and the Colorado River is important, for it is connected closely with the discovery of "the seven cities." The same river was reached by a party consisting of twelve men, under Don Garci Lopez, who were sent out by Coronado after his return to Cibola. After a journey of twenty days through the desert they reached the river, whose banks were so high "they thought themselves elevated three or four leagues in the air." "Their efforts to descend were all made in vain."

On quitting the Gila they entered the desert and at the end of fifteen days came within eight leagues of Cibola. There the first Indians of the country were discovered. On the following day they entered the inhabited country, but as the army came in sight of the village they broke forth into maledictions. The following is Castaneda's description of the place:

> Cibola is built on a rock and this village is so small that in truth there are many farms in New Spain that make a better appearance. It may contain two hundred warriors. The houses are built in three or four stories; they are small, not spacious and have no courts, as a single court serves for a whole quarter. The inhabitants of the province were united there. It is composed of seven towns, some of which are larger and better fortified than Cibola. These Indians, ranged in good order, awaited us at some distance from the village. They were very loth to accept peace; when they were required to do so by our interpreters, they menaced us by their gestures. Shouting our war cry of Sant Iago, we charged upon and quickly caused them to fly. Nevertheless, it was necessary to get possession of Cibola, which was no easy achievement, for the road leading to it was both narrow and winding. The general was knocked down by the blow of a stone as he mounted in the assault, and he would have been slain had it not been for Garci Lopez de Cardenas and Hernando d'Alvarado, who threw themselves before him and received the blows of the stones which were designed for him and fell in large numbers; nevertheless, as it was impossible to resist the first impetuous charge of Spaniards, the village was gained in less than an hour. It was found filled with provisions, which were much needed, and, in a short time, the whole province was forced to accept peace."

From Cibola the general sent out Alvarado with twenty men, who, "five days after, arrived at a village named Acuco."

> "This village was strongly posted, inasmuch as it was reached by only one path, and was built upon a rock precipitous on all its other sides, and at such a height that the ball from an arquebuse could scarcely reach its summit. It was entered by a stairway cut by the hand of man, which began at the bottom of the declivitous rock and led up to the village. This stairway was of suitable width for the first two hundred steps, but after these there were a hundred more much narrower, and when the top was finally to

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*Melchior Diaz, who had been left at Sonora. placed himself at the head of twenty-five men, under the lead of guides, and followed up the coast one hundred and fifty leagues, until he arrived at the river called Rio del Tizon, whose mouth was two leagues wide. He reached the spot fifteen leagues from its mouth and found the tree marked by Alarcon, dug and found the letters. The party crossed the Rio del Tizon on rafts and turned toward the southeast, thus going around the Gulf of California. No ruins were discovered by this party. The spot which this party reached was much nearer its source than where Melchior Diaz had crossed, though the Indians were the same which Diaz had seen.

be reached it was necessary to scramble up the three last steps by placing the feet in holes scraped in the rock, and as the ascender could scarcely make the point of his toe enter them he was forced to cling to the precipice with his hands. On the summit there was a great arsenal of huge stones, which the defenders, without exposing themselves, could roll down on the assailants, so that no army, no matter what its strength might be, could force this passage. There was on the top a sufficient space of ground to cultivate and store a large supply of corn, as well as cisterns to contain water and snow."

Three days' journey thence Alvarado reached a province called Tiguex, where he was received very kindly, and was so well pleased that he sent a messenger to Coronado inviting him to winter there. Five days' journey thence Alvarado reached Cicuye (Pecos), a village very strongly fortified, whose houses had four stories. "Here he fell in with an Indian slave, who was a native of the country adjacent to Florida, the interior of which Ferdinan de Soto had lately explored." The Indian, whom they called the Turk, spoke of certain large towns and of large stores of gold and silver in his country and also the country of the bisons. Alvarado took him as a guide to the bison country, and after he had seen a few of them he returned to Tiguex, the Rio Grande, to give an account of the news to Coronado.

While the discoveries above mentioned were being made, some Indians, living seventy leagues toward the east arrived at Cibola. They offered gifts of tanned skins, shields and helmets, and spoke of the cows whose skins were covered with a frizzled hair resembling wool, showing they were buffaloes.

Coronado, who had remained at Cibola, hearing of a province composed of eight towns, took with him thirty of the most hardy of his men and set out to visit it on his way to Tiguex or Rio Grande. In eight or eleven days he reached the province called Tutahaco, which appears to have been situated below the city of Tiguex. The eight villages comprising this province were not like those of Cibola, built of stone, but of earth. He learned of other villages still further down the river. In the meantime the army moved from Cibola toward Tiguex. The first day they reached the handsomest and largest village in the province, where they lodged. "There they found houses of seven stories, which were seen nowhere else. These belonged to private individuals and served as fortresses. They rise so far above the others that they have the appearance of towers. There are embrasures and loop-holes from which lances may be thrown and the place defended. As all these villages have no streets, all the roofs are flat and common for all the inhabitants; it is therefore necessary first of all to take possession of those houses which serve as defenses."

The army passed near the Great Rock of Acuco (Acoma), already described, where they were well received by the inhabitants of the city perched on its summit. Finally it reached

Tiguex, where it was well recieved and lodged. It was found, however, that the whole province was in open revolt, and the army was obliged to lay siege to the city and capture it anew. After the siege the general dispatched the captain to Cia, which was a large and populous village four leagues west of the Rio Grande. Six other Spaniards went to Quirix, a province composed of seven villages. All these villages were at length tranquilized by the assiduous efforts of the Spaniards. The army spent the winter here, but early in the next season, May, 1541, they took up the march to Quivira in search of the gold and silver which the Turk said could be found there. The route was via Cicuye (Pecos), twenty-five leagues distant. After leaving Cicuye (Pecos) and crossing some mountains they reached a large and deep river which passed near to Cicuye, and was therefore called the Rio de Cicuye (Pecos). Here they were delayed four days to build a bridge. Ten days after, on their march, they discovered some tents of tanned buffalo skins inhabited by Indians who were called Querechaos.

Continuing their march in a northeasterly direction they came to a village which Cabeca de Vaca had passed on his way from Florida to Mexico. The army met with and killed an incredible number of buffaloes; but reached a point 850 miles from Tiguex. Here, the provisions giving out, Coronado with thirty horsemen and six foot soldiers continued his march in search of Quivira, while the rest of the army returned. The guides conducted the general to Quivira in forty-eight days. Here they found neither gold nor silver, though the Cacique wore on his breast a copper plate, of which he made a great parade. The army, on its return from the prairies, came to four large villages and reached a place where the river plunged beneath the ground. In the beginning of 1542 Coronado returned by the way of Cibola and Chichilticale to Culiacan, and finally reached the City of Mexico.

Thus ended the great expedition which for extent and distance traveled, duration in time (more than two years) and for the multitude of its discoveries, and the many branch explorations, excelled any land expedition that has been undertaken in modern times.

It was the first expedition which was ever led into the southwest interior, but did more to bring to light the wonderful villages or pueblos located there than any other that has ever taken place. To us the narrative of the expedition is of very great value, for it reveals the exact condition of the country as it was three hundred and fifty years ago. It is to be remembered that this expedition took place less than fifty years after the discovery and only fifteen years after the expedition by Ferdinan de Soto, and eighty years before the landing of the Pilgrim Fathers. It resulted in disappointment to the leaders, for they had expected to find cities filled with gold, similar to those which had been discovered by Cortez in Mexico and by Pizarro in Peru; but, instead, they found solitary buildings in ruins, and such villages as were inhabited were situated on barren rocks, and were perfectly destitute of gold or silver or the precious metals. The region which they went so far to reach was inhabited by wild tribes, who dwelt in huts or wigwams, and chased the buffalo for subsistence.

There were two motives which ruled the Spaniards wherever they went—the thirst for gold and the conversion of the natives. The thirst for gold was not satisfied, but the opportunity for christianizing the Indians was great. So the country continued to be occupied by the Spanish missionaries. From this time on, the history is one of missions rather than of discovery or conquest, though there were various military expeditions and many fierce battles. The revolts of the natives against the dominion of the priests required the presence of armed hosts, and only ended with the subjugation of the people by military force. New Mexico was brought altogether under Spanish rule by Juan de Onate in 1595. In 1680 the natives threw off the yoke, but were again subdued fifteen years later. The archives of the missions were destroyed in the revolt, and the history previous to that date is only known in outline. The diaries kept after this date show that the authors visited many of the ruins which have attracted the attention of later explorers, and also that they found many of the towns inhabited which now exist only as ruins.

We shall not dwell further upon the history of the region, nor shall we at the present time speak of the discoveries which have taken place since the region came into the possession of the United States government; but shall proceed at once to the question whether these various localities visited by the Spaniards under Coronado can be identified. This is an important question, for it brings out the changes which have occurred in three hundred and fifty years, and at the same time throws light upon the relative age of the different ruins.

I. We shall first speak of the distribution of the pueblos. On this point we shall quote the words of Dr. Washington Matthews, who long resided at Fort Wingate, and is familiar with the whole region. He says: "Along the great Cordillera of the American Continent, on both sides of the equator, from Wyoming to Chili extends a land abounding in ancient ruins. A large part of this land lies in the boundary of the United States. It contains the Territory of Arizona, most of Utah, more than half of New Mexico, extensive parts of the states of Colorado and Nevada, with small portions of Texas and California. The great rivers which drain it into the ocean are the Colorado on the west, and the Rio Grande on the east; the former flowing toward the Pacific, the latter toward the Atlantic. It is an arid region, but not an absolute desert, for there is no part of it on which rain does not fall some time during every year, but it is on the high mountains only that it descends abundantly, while on the lower levels the moisture is scanty, and irrigation is necessary to successful agriculture. The ruins have been known to the world for three centuries and a half; they have been in the possession of the United States for over forty years. Yet it is only within the past few years that any attempt at systematic exploration or excavation has been made among them.*

A. F. Bandelier says: "The northern limits of the House-builders remains yet to be definitely established. Taos seems to be the northernmost Pueblo. The eastern limits seem to be the meridian of the Pecos River; the western, the great Colorado, and the dismal shores of the Gulf of California; the southern limits, the ruins found in southern Colorado and in southern Utah. Within the area thus defined the villages were scattered very irregularly, and in fact their inhabitants occupied and used but a small quantity of the ground. Extensive desert tracks often separated the groups and these spaces were open to the roving Indians, who prowled in and about the settlements much to the detriment of the inhabitants. Thus, Acoma, is separated from the Zuni group by at last seventy miles of waste, and the Navajos raided over this space at will, endangering communications from the Tehuas, while both tribes were some distance away from the Rio Grande and the side valley. From Acoma to the Rio Grande another forty miles of desert intervened. Between the latter and Tiguex the uninhabited region is from thirty to forty miles, and here the Apaches could lurk and assault at any time. A desert stretch of twenty miles separated the pueblo of Picuries from the Tahuas; and a stretch of thirty miles separated them from Taos. Twenty-seven miles to the southwest of Santa Fe is Cochiti, and three miles east of the stream is the old pueblo of Santa Domingo; on the same side but directly on the river bank stood Katishtya, the antecessor of the present Felipe. Farther west on the Jemez River the Queres inhabited several sites. Here was a cluster of the Cia towns, and northwest of Cia began the range of the Jemez who inhabited a number of pueblos along the Jemez River.† The Pueblos, far from being masters of New Mexico previous to the coming of the Spaniards, were hemmed in and hampered on all sides by tribes which were swift in their movements, and had a great advantage over the Pueblos in number.

It must not be supposed that the area indicated is uniformly covered, for there are many districts utterly devoid of ruins.

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*See Seventh Memoir National Academy of Science Vol. VI, Human Bones of the Hemenway Collection, by Dr. Washington Matthews, U. S. A. Introduction p. 142.

†The total number of pueblos, as stated in the sixteenth and seventeenth centuries, does not at all agree with that number as it stands at the present time. It is much larger and varies from forty-six (Escalante, from reports at the time of the rebellion,) to over one hundred. (Onate, in the Acts of Submission of 1598.)

Very few are found in the high forests, for it is useless to look for ruins at an altitude exceeding 8,000 feet—climate, lack of space for cultivation, together with the steepness of slopes forbid. The lower limits of the ruins seem mostly dependent on natural features. On the side of Arizona, but not on the sea-coast the ruins ascend within 1,000 feet of the sea level. There are said to be traces of the succession of ruins along the Canadian River far across the great plains."*

"There is nothing in the natural resources of New Mexico that could maintain a large number of people whose industrial means of support were those which belonged to the "stone age." The water supply of the territory is remarkably scant, and, while the Indian knew and used springs which the present settler is sometimes unacquainted with, the value of such springs was not very great. They might suffice for the wants of one or a few families, some times for a small village. To such watering places the Indian was limited, outside of the river bottoms of larger streams. But the larger streams are few and far between, and only portions of their course are suitable for cultivation. Only the Rio Grande, the San Juan, the Chama, parts of the Pecos, Jemez, Puerco and Upper Gila irrigate large valleys."†

Mr. L. H. Morgan says that "New Mexico is a poor country for civilized man, but quite well adapted to the sedentary Indians, who cultivated about one acre out of every hundred thousand. This region and the San Juan immediately north of it possessed a number of narrow, fertile valleys, containing together possibly 50,000 inhabitants, and it is occupied now by their descendants (excepting the San Juan) in manner and form as it was then. The region is favorable to the communistic mode of life, cultivation of the soil by irrigation being a necessity."

The disappointment of the Spaniards, who came from the mountain city and were familiar with the luxuriant growth of the southern coasts, and found this region so destitute of forests and so silent and lonely, must have been great, for it was a new experience to them. So it is with every one who traverses the region. The scenery is entirely different from that which prevails elsewhere, and the life is as different as the scenery.

As to the age of the pueblos very little can be said. One supposition is that the people formerly dwelt in one-story houses, which were clustered together in a circle with a court in the center, something like those in Arizona Territory, which Bandelier says has the "checker-board" appearance; but the attack of the wild tribes, which were the Navajos and Apaches, compelled

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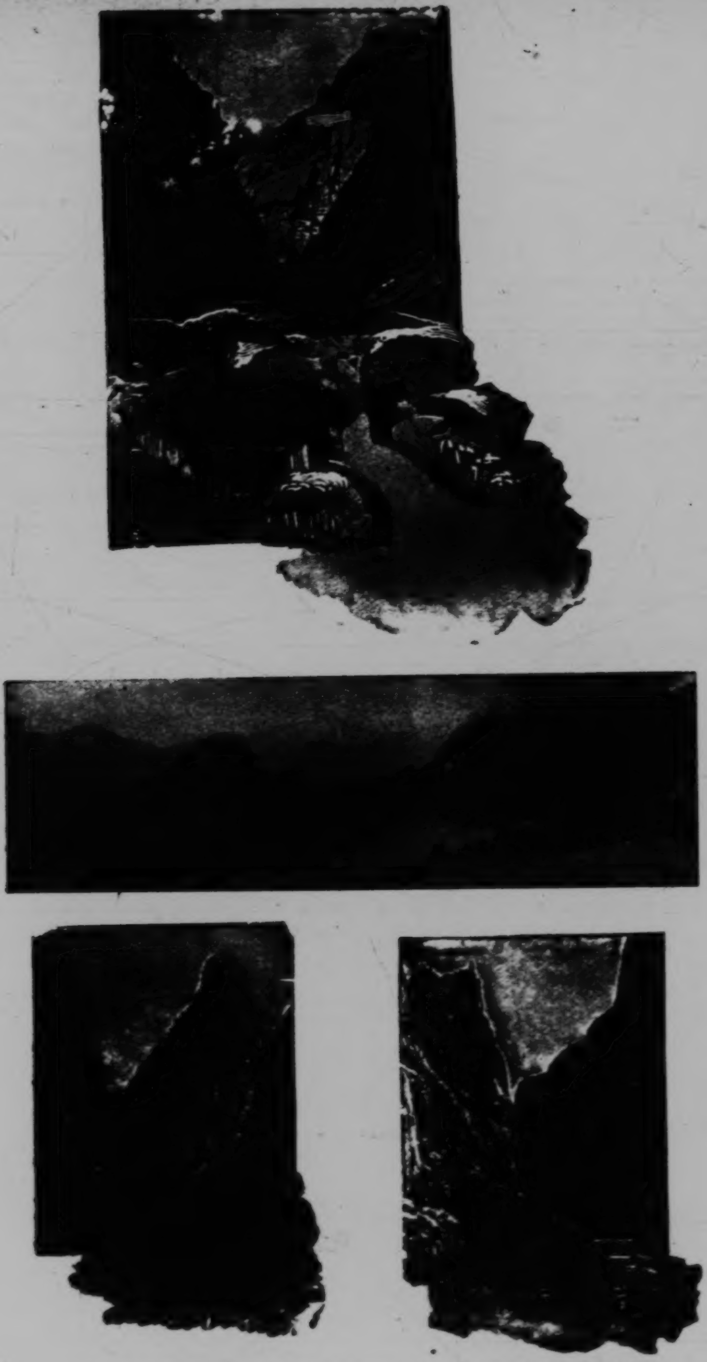
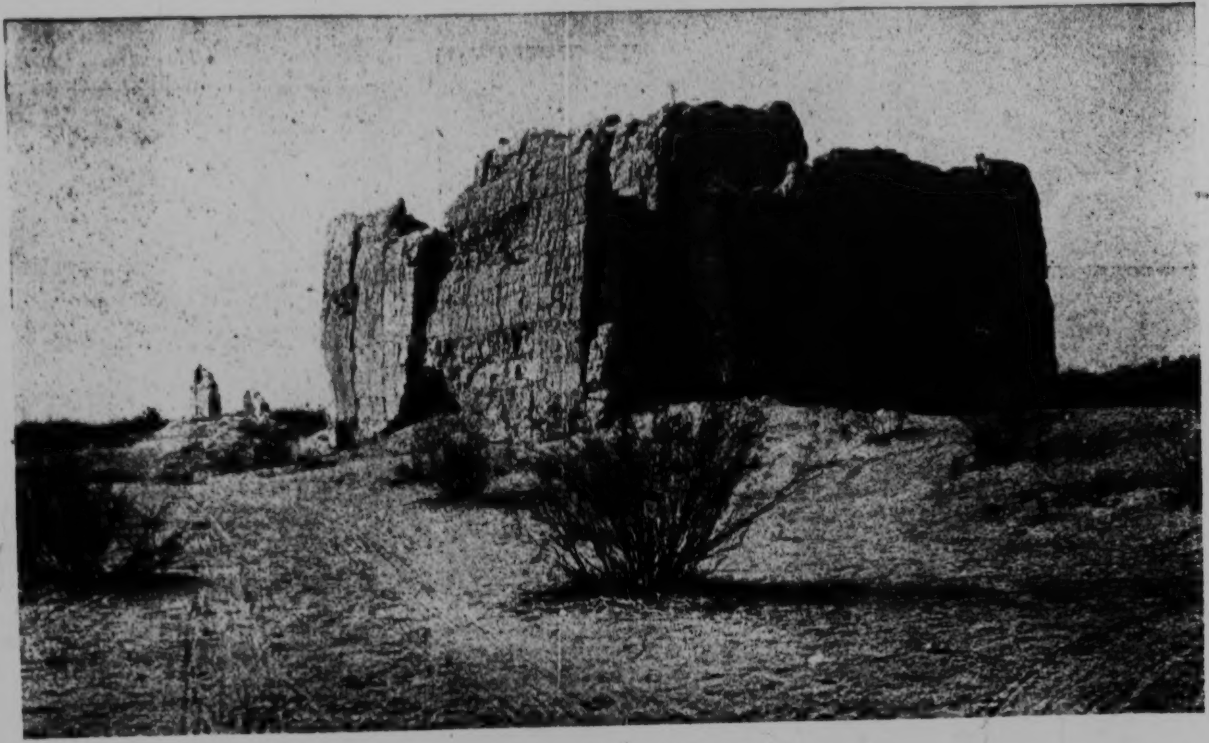
*The plains of San Augustine in Southwestern New Mexico, the plateau of the Natanes in Eastern Arizona, the banks of the Rio Grande from the San Louis Valley to the end of the gorge appear not to have been settled in ancient times.

†A line from Taos in the extreme north as far south as where San Marcial now stands, makes a length of nearly 230 miles; from east to west they spread from longitude 105° 30′, (Taos and Pecos) to nearly 110° 30′, (the Moqui villages.) Lieut. Simpson makes the distance east and west 360 miles. (See Final Report, Part I., p. 119.)



SCENES IN THE CHEYENNE CANYON AND ON THE RIO GRANDE.



CASA GRANDE ON THE GILA.

them to build their houses in terraces, making them resemble modern flats, except that the lower stories were closed. The upper stories were reached by ladders, each story having a terrace or platform in front of it. The relative age of the Pueblos and Cliff-dwellers is a mere matter of conjecture. Some think the Cliff-dwellers the older; others regard them as later, though no cliff-dwelling has yet been found occupied. It is a common impression that the pueblos are all very ancient; but recent investigations have proved the contrary. The majority of the pueblos which were visited were occupied, and were probably built by the people who dwelt in them, but their history could not be carried back to a certainty more than five or six hundred years.* The buildings which are now standing, and are at present occupied, are not the ones visited by the Spaniards. The villages have been moved and new structures have been erected several times over during the three hundred and fifty years which have elapsed, though they are in the same vicinity and their architecture and mode of life may be very similar. This makes it more difficult to identify the exact spots which were visited of which we have the descriptions, though it gives us a better idea of the people and the persistency of their customs, if we take the later accounts and compare them with the earlier.

II. Taking the localities through which the Spaniards passed, let us now see how many of the ruins can be identified. We shall begin with the place called Chichilticalli. The question is whether Casa Grande was actually the building which was reached. On this point we shall quote first from Father Font, who saw it in 1775, and says it was known by the name of Montezuma, and was one league from the Rio Gila. "The Casa Grande, or palace of Montezuma, must have been built five hundred years previously (in the thirteenth century), if we are to believe the accounts given by the Indians; for it appears to have been constructed by the Mexicans at the epoch of their emigration when the devil, conducting them through different countries, led them to the promised land of Mexico." This was the Spanish conception of the ruins.

Various American travelers have visited this region—Emory and Johnson in 1846, Bartlett in 1852, Ross Brown in 1863, Leroux in 1854, Bandelier in 1880–1885, F. H. Cushing and Washington Matthews in 1887. Emery's description is as follows:

> It was the remains of a three story mud house sixty feet square, pierced for doors and windows. The whole interior of the house had been burnt out and the walls much defaced. The site of the house is flat on all sides; and the ruins of the houses which compose the town extend more than a

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* Certain pueblos were mentioned to Fray Marcos of Niza, under the name of Totonteac, a Zuni term applied to a cluster of twelve pueblos lying in the direction of Moquis, which were abandoned before the sixteenth century, but the reminiscence of which still remained in the name. See Bandelier, Vol. III, Part I, p. 114.

league toward the east. All the land is partially covered with pieces of pots, jugs and plates painted in different colors—white, blue and red—very different from the work of the Pimas. The house forms an oblong square facing exactly the four cardinal points; and round about there are ruins indicating a fence or wall, which surrounded it. In the corners there appears to have been some edifice like a castle or watch tower. The interior of the house consists of five halls—three middle ones of one size, twenty-six feet by ten feet; the extreme ones longer, thirty-eight feet by twelve feet; all eleven feet high. The inner doors are of equal size, two feet by five feet; the outer doors are double width. The inner walls are four feet thick; the outer walls six feet thick. All of the building is of earth, and according to appearances is built in boxes or moulds of different sizes. A trench leads from the river at a great distance, by which the town is supplied with water. It is now nearly buried up. The house is seventy feet from north to south, and fifty from east to west. The interior walls are four feet in thickness; they are well constructed; the interior walls are six feet thick. The edifice is constructed of earth, in blocks of different thickness and has three stories. We found no traces of stairways. We think they must have been burnt when the Apaches burnt this edifice."*

Bandelier describes Casa Grande and the cities adjoining, as well as the canals. He says:

"The careful study of documents is indispensable for successful exploration of the antiquities of the country. Numerous notices of ruined villages are scattered throughout the voluminous archives of Spanish rule in the Southwest. I will refer here only to the descriptions of the Casa Grande by Father Rino and Father Sedelmair; of the Casa Grand, by Rivera; Northwestern New Mexico, by Father Escalante. Their descriptions, dating back, enables us to restore much in these edifices to which their present conditions gives no clue."

"Between Casa Grande and Florence the distance eastward is nine long miles, and the country shows no change. Several ancient irrigating ditches are seen on the road, some of which are quite deep. Nowhere did I notice any trace of a lining or casing, as at Tule; the raised backs or rims seemed to be only of the soil. Ruins in scattered clusters are numerous, all of the same character. In one place I found an elliptical tank almost as large as the one at Casa Grande and presenting a similar appearance. Wherever walls protruded the walls were the same, only thinner. This may be due to the fact that that they were merely partitions, and that I nowhere could measure the outer ones, which have crumbled. In short, from Casa Blanca in the west—and probably some distance beyond—a line of ruins extends to east of Florence, and probably as far as Riverside, or a stretch of more than sixty miles. These ruins, however, do not reach very far inland, although some are scattered throughout Papagneria. At this day Casa Grande shows two stories with vertical walls on all four sides, and from the center rises a third story like a low tower. Whether the latter originally extended over the whole building or not, I am unable to determine."

Dr. Washington Matthews' account is more complete and full, and includes many new localities. It appears that the Hemenway Expedition arrived in the valley of the Salt River, a tributary of the Gila, in Arizona, and began excavating some stone ruins on the uplands, but were attracted by some earth mounds on the flood. The result was the discovery of an extensive collection of habitations—a city it might be called—some six miles in length and from half a mile to a mile in width. The mound proved to be the débris of a great earthen house, of many stories and many chambers, and analagous in structure to the still-standing Casa Grande, before referred to, which is distant from the mound to the southeast less than thirty-five miles in a direct line. In the course of excavation at this place so many skeletons were found under the floors of the houses that Mr. Cushing devised for it the Spanish name of Pueblo de los Muertos, or, briefly, Los Muertos, the town of the dead; and this name was retained for it, although he subsequently found other ruined cities in the vicinity where skeletons were as common as here.

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*Notes of a military reconnoissance made by Lieutenant Colonel William A. Emory, Corps of Topographical Engineers, in 1846-47, with the advance guard of the Army of the West p. 82.

The party discovered the remains of six other large cities within ten miles. Of these three were named: First, Los Acequias, from the number, size and appearance of the old canals or irrigated ditches through which the inhabitants conducted water to their fields; second, Los Hornos, the ovens, from the number of earthen ovens found there; third, Los Guanacos, because in it were found small terra-cotta images of animals thought to resemble the llama of South America. In these ruined cities the remains of buildings like the Casa Grande were found. They were of four kinds: 1, temples; 2, estufas; 3, communal houses; 4, ultramural houses. Of the temples there was only one to each city and this was centrally located; though in one of the cities there were seven such buildings, the largest of which was in the center. Each building was surrounded by a high wall from five to ten feet thick. The lower story of each was divided into six departments, which were used as store rooms for the priests. The other stories were used as priestly residences. The entire building served as a fortress in times of danger.

The sun temples, or estufas, were built of earth on a great basket frame of hurdles, elliptical in shape, were roofed with a dome made of spiralling, contracting coils of reeds, which were heavily covered on the outside with mud, and resembling an elongated terra cotta bowl inverted, reminding one of the Mormon temple. The dimensions were about 150 feet in width, 200 feet in length. The floor within was elevated so as to form a sort of ampitheater. It is thought that in these buildings public rites of the esoteric societies were performed, as they were in close proximity to the priests' dwelling.

The communal houses were the principal dwelling places. They were built of mud without the hurdles. These contained many ruins on the ground floor and are thought to have been

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*Dr. Washington Matthews speaks of figures inscribed on the rocks representing animals which resemble the Llamas of Peru and hunters throwing lassos at them These may possibly have been elks, for they are associated with other animals with horns like the deer, and there is no evidence that the people knew anything about the Llamas. There are turkeys inscribed upon the rocks. These were probably the domestic fowls, for tame turkeys were common among the pueblos.

*This illustrates the superstition ut the six houses of the sky: 4 for the cardinal points; 2 for the zenith and nadir, the homes of separate clans. Each was surrounded by a high earthen wall and generally by a separate canal or acequia. Each had its single appropriate water reservoir with a branch canal leading into it, its own separate Pyral mound, or place of cremation, and its one great underground oven for the preparation of food. In Los Muertos at least fifty of these great buildings were unearthed.

The ultra mural houses were small low huts made of sticks and reeds, and were situated outside the limits of the earthen houses and formed separate groups, Each contained a central fire-place. In one place they constituted a town of considerable size, which contained a sun temple, but no priest temple. They may have belonged to the Pimas or some later modern tribes.*

The acequias or irrigating canals are noteworthy. The explorers in the Salado Valley have traced over one hundred and fifty miles of the larger canals. They varied in width from ten to thirty feet; and in depth from three to twelve feet. Their banks were terraced in such a form as to secure a central current. This device was to facilitate navigation; and it is thought that the canals were used not only for irrigation, but for the transportation of the produce of the fields and of the great timbers from the mountains which the people must have needed in the construction of their tall temples and other houses.

In various parts of our arid region the old Indian canals may be still easily traced where they are cut through hard soil or where they are so exposed and situated with regard to the prevailing winds, that the sand is blown out of them rather than drifted into them. There are places in Arizona where the American settlers utilize old canals for wagon roads. But in most cases the canals have been filled with sand and clay to the level of the surrounding soil, and, to the ordinary observer, no vestige of them remains. Yet, Mr. Cushing, guided by his knowledge of a custom which exists among the Zuni Indians, was able to trace the course of these obliterated channels. The ancients constructed great reservoirs to store the excessive water when the river was high. The present occupants have no such works. The canals of the moderns follow straight lines; those of the ancients were tortuous. In the old canals the fall was about one foot to the mile, in the new it is two feet to the mile. The ancient people used the water to a greater advantage than the moderns and covered a wider territory with their system. A Mormon community made use of the prehistoric cut and saved $20,000 by this means. The ancient people had also a system

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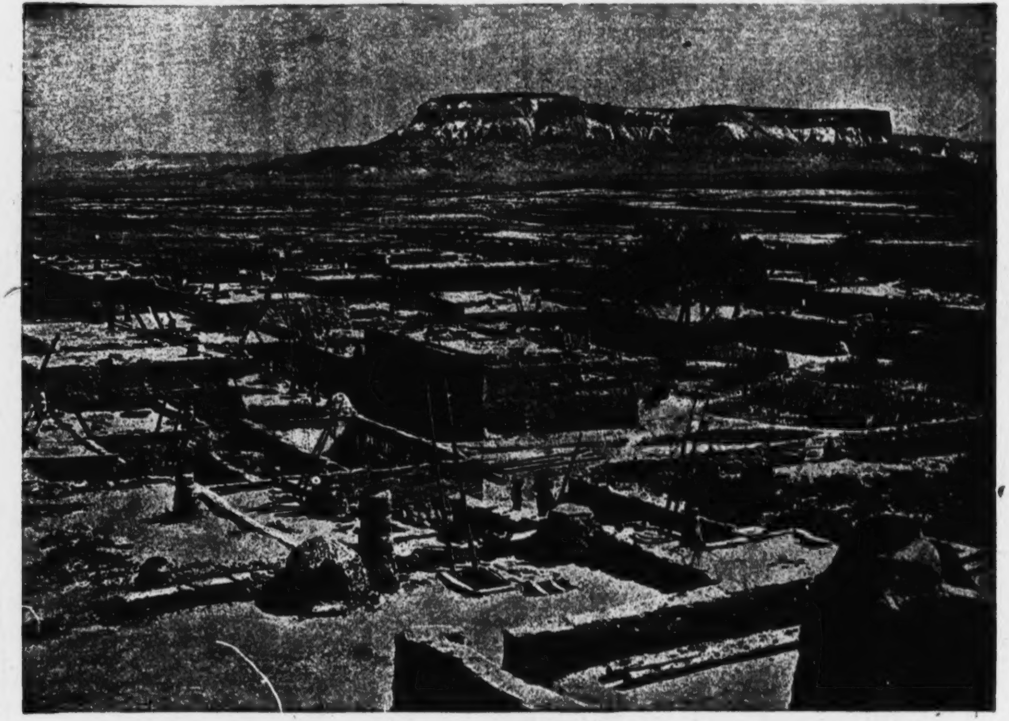
*Mr. Bandelier speaks of the enclosures found apart from the houses, rectangular spaces surrounded by upright small stones. The Pima Indians assert that these were garden-beds. They are now very numerous in Arizona. He says that the scattered remains of permanent villages with artificial tanks, mounds of houses constructed of marl—sometimes more than one story high met here and there are evidences of a period of relative quiet that has long since disappeared; though he thinks the Pimas may have built these canals. The Yumas and the Papagoes continue to occupy the region.



ZUNI WITH TA-A-YA-LA-NA IN THE DISTANCE.

of rainwater irrigation. For conserving the waters of the sudden rains on the mountains and hills the people built dams in the ravines and large reservoirs in the neighboring foot hills. From these reservoirs the waters were allowed to flow gradually over the fields.

III. The groups which have always gone by the name of "seven cities of Cibola" will next be considered. The description given by Friar Marcos de Nizza is the first one. It dates back to 1538. There has been some discussion as to which one of the seven cities he saw. He did not enter any of the pueblos, but the principal men led him to a place where he could see Cibola from afar. His description is as follows. "Cibola lies in a plain on a slope of a round height. Its appearance is very good for settlement—the best that I have seen in these parts. The houses are as the Indians told me—all of stone with their stories and flat roof. As far as I could see from a height where I placed myself to observe I could see that the city was larger than the City of Mexico itself. The Indian guides reiterated the statement that the village now in view was the smallest one of the seven; and that Totonteac (Tusayan) was much more important than the so-called seven cities. Here he raised a wooden cross,* naming the new land the New Kingdom of Saint Francis, and turned back with much more fright than food."

The latest description is the one given by Victor Mindeleff, of the Ethnological Bureau, who says: "It has been the custom to give the name of Old Zuni to a group of small and ruined pueblos which lie at the summit of the great mesa called by the Indians Thunder Mountain, *Ta-a-ya-la-na*, and that the six villages on that formidable height were the original ones of the Zunis. This much is certain, that it was the place of refuge—the citadel or safety place—of the Zuni, the center of many religious performances, and the object of many myths. Three times, according to the records, did the Zuni flee to the plateau of this gigantic mesa within the course of two centuries. Each time they were induced to return to the valley below in a peaceable manner. This Thunder Mountain rises to the height of one thousand feet above the plain, and is almost inaccessible. There are two foot trails, each of which in places traverses abrupt slopes of sandstone where holes have been pecked into the rock. From the northeast side the summit of the mesa can be reached by a tortuous burrow trail. All the rest of the mesa is too abrupt to be scaled. The top of the mesa was an irregular figure, one mile in width, and surrounded on all sides by perpendicular cliffs."[*]

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* Bandelier thinks that Kiakima was the place where the negro was killed and where Niza erected the cross. This has been disputed by Hodge, who thinks that Kuikawkuk was the first-discovered city of Cibola. The early Spanish names of the towns are Macaquia (Masaki), Coquimo (K'iakima), Aquico (Hawikuh), Canabi (Kianawe), and Alona (Halona). (See American Anthropologist Vol. VIII No. 2. P. 142-149.)

The following names are given by Mr. Cushing and by Mr. Bandelier: Halona on the site of the present one, Kiakima, south of the gigantic mesa, Matzaki; north of the same mesa, the place where the negro, Estevan, was killed; Pianaua, three miles south of the actual Zuni; Huhauien, Zuni hot springs; Chanahue, the same vicinity. Bandelier Vol. III, Part 1 P. 133.

"The narrative of Castaneda describes Cibola as built on a rock. The road leading to it was both narrow and winding. It was no easy achievement to get possession of it. The village of Zuni, as it now stands, is built upon a small knoll on the bank of the Zuni river, three miles west of the conspicuous Mesa. It is the successor of all the original seven cities of Cibola, and is the largest of the Pueblos. At this point the river is perennial, it has no special advantages for defense, but the convenience to large areas of tillable soil led to the selection of the site. It displays a remarkable compact arrangement of dwellings, some of which have been carried to a great height. Five distinct terraces may be seen on the south side of the cluster, though the highest point is said to have reached a height of seven terraces at one time. The arrangement of dwellings about a court, characteristic of the ancient pueblos, is not seen; for the original building had been covered with rooms of later date. The old ceremonial kivas in rooms for the meeting of the various orders or secret societies were crowded into the innermost recesses of this innermost portion.[†]"

General Simpson says that it is far more compact than Santa Domingo—its streets being narrow and in places presenting the appearance of tunnels, or covered ways, on account of the houses extending over them.[‡]

Acoma, whose remarkable situation on the top of a high rock has made it the most conspicuous object in New Mexico for nearly three centuries, is easily identified. The case is, however, different with Tiguex. It is mentioned as lying three days from Acoma, but the direction is not given. The belief has been expressed that Santa Fe stands on the old site of Tiguex. W. H. Davis locates it on the Rio Puerco, and Cicuye on the Rio Grande some where near the valley of Guadalupe. Gen. Simpson places it at the foot of Socorro Mountains on the Rio Grande and Cicuye at Pecos. Bandelier places Tiguex near Bernalillo, and identifies Tutahaco four leagues to the south of Tiguex with Isleta, and says that this was on the same river as Tiguex. From it Coronado ascended the stream to Tiguex. Castaneda says that "Tigeux is the central point."

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[*] See Plate, Eighth Annual Report, P. 89.

[†] See Eighth Annual Report Bureau of Ethnology, p. 97.

[‡] The villages of the Moquis were situated northwest from the Zunis, twenty-five leagues but Coronado seems to have passed by them on his way to Cibola.

This Cibola was the first pueblo which Coronado reached on his way eastward and the last one which he left on his return. Espejo in 1583 visited the same region and after leaving Acoma turned toward the west to a certain province called by the inhabitants of Zuni, and by the Spaniards, Cibola; in which province Coronado had erected many crosses which yet remain standing.

The American Atlas by Thomas Jefferys, London, 1773, gives Zuni and Cibola as synonimous names.

Bandelier gives the following evidence that the Zuni and Cibola have been properly identified. He quotes Castaneda. (1.) "Twenty leagues to the northwest is another province which contains seven villages the inhabitants have the same costumes, customs and religion" as "those of Cibola," "Tucayan" This was called by "Jaramillo Tucayan to the left of Cibola, about five days' march. West of them is the river called "Rio del Tizon" or Gila River. (2.) Five days journey to the east there was a village called Acuco. Jaramillo says: "A village in a very strong situation on a precipitous rock called Tutahaco. (3.) This village "Tutahaco," Acoma, lay between Cibola and the stream running to the southwest, according to Jaramillo, "entering the sea of the north." (4.) Jaramillo says: "All the water courses which we met whether they were streams or rivers, until that of Cibola, and I believe in one or two journeyings beyond, flow into the South Sea." (5.) "All the writers from Antonio del Espejo, 1584, down to Gen. J. H. Simpson, 1871, have identified Zuni with Cibola."

In regard to the identity of the Moqui district with the Tusayan, he says. It was first made known under the name of Mohoce in 1583, by Antonio de Espejo, "Four journeys of seven leagues each westward from Cibola." One of its pueblos was called "Aguato," Awatobi. Fifteen years later in 1588, Juan de Onate found a pueblo Mohoce twenty leagues westward of the first one of Zuni. (See papers of A. I. A. Page 12, Vol. I.)

An expedition was sent from it which discovered in succession Quirix on the river, with seven villages, the Quires district including San Domingo, Cochiti, San Felipe, Santa Ana and Cia, near the Rio Grande, Aguas, Calientes, three villages, Acha *Picuries* to the northeast, and "Braba" *Taos* far to the northeast. Bandelier says it is unmistakable and refers to Castaneda and Jean Bleau.*

Recent investigation has thus enabled us to locate at the time of the first discovery a large number of the principal pueblos, or groups of pueblos, of New Mexico and Arizona. The pueblo of Casa Grande appears to have occupied at that time the identical position in which it is found to-day. The pueblo of Zuni occupies the ground claimed by the cluster to which the name of "Cibola," or "Seven Cities," was given, but it is the only remaining one of the seven, and is probably a recent construction. The Moqui towns appear to be the same which the Spaniards found three hundred and fifty years ago. It is probable also that Isleta is the same as Tutahaco, which Coronado reached in "eight or eleven days," and Acoma the same as Acuco. Pecos was situated on the Tiguex Rio Grande, and is the same as Cicuye.

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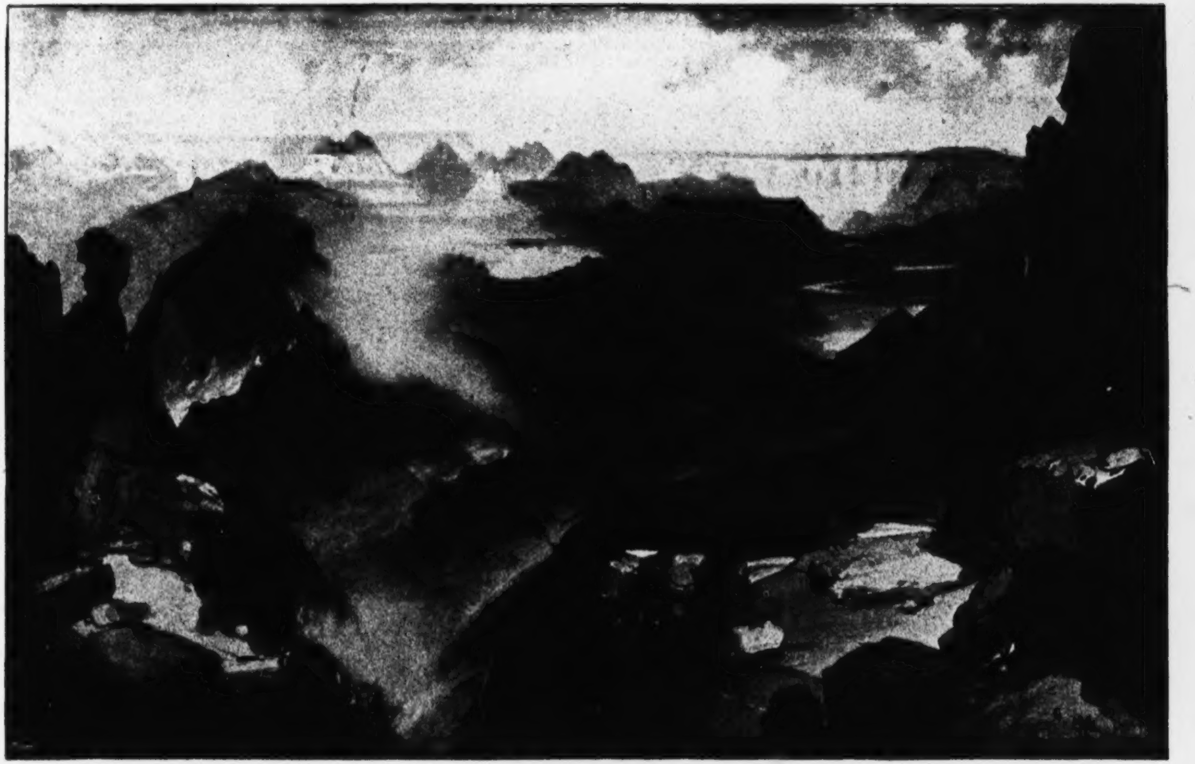
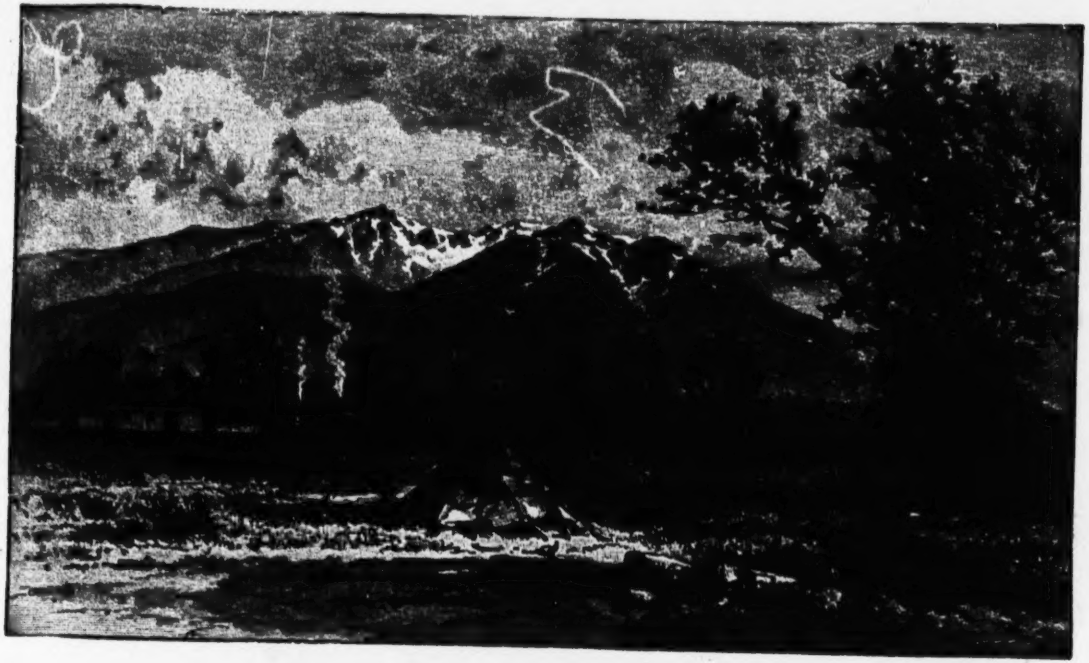
*Simpson says: There were a number of villages visited by Coronado which were situated on the Rio Grande or its tributaries—Quirix unquestionably, San Felipe, De Queres. In the Snow mountains, seven: Kimena. three; Chia. one; Silla (Cia). Hemes, Jemmes. Aguas, Calientes, the ruins which I have seen at Ojos Calientes, twelve miles above the Hemes on the Rio de Hemes and Braba Taos. The last town on the Rio, Tiguex, was built on the two banks of a stream, which was crossed by bridges built of nicely squared pine timber.)



THE GRAND CANYON OF THE COLORADO.



SIERRA BLANCO MOUNTAIN.

# CHAPTER V.

## SPANISH AND AMERICAN OCCUPATION.

The geological history of the great plateau of the west is so closely connected with the history of the people that it seems absolutely necessary that we should get a correct idea of it before we proceed. The following from the pen of Dr. J. S. Newberry will be appropriate.[*] He says: "To what cause is due the mesa, or table land plateau of the country? This much we can fairly infer from the observations already made; that the outlines of the North American continent were approximately marked out from the earliest palæozoic times. Many thousand feet of sedimentary strata were converted into dry land, by the gradual upheaval of the plutonic rocks, upon which they were deposited. Gradually they were raised, without much disturbance, to their unequal positions, though lines of more powerful upheavals can be traced in the increased heights of the table lands, while here and there volcanic forces have thrust up huge masses of igueous rock through the sedimentary crust, forming mountains more or less isolated and of great beauty, which contrast strongly with the eroded mesa lands, among which they rise.

"The plateau of the Colorado itself has been raised to an average of 7,000 feet. It extends in a north-northwest direction from a point southeast from San Francisco mountain across the Little Colorado into Utah, and includes the country traversed by Grand and Green river, as well as a more considerable part of that crossed by the Colorado, Chiquito and the San Juan.

"From their source onward these two rivers and their tributaries, in their passage over the table lands of the great central plateau, have cut their way in channels which deepen continually as they advance, and also present fewer and fewer open valleys as they progress, to break the narrow, sunless perpendicularity of their gigantic walls.

"In the case of the Colorado, this penetrative tendency culminated in a canyon 3,000 to 6,000 feet deep. Over the plateau the Colorado river flowed for at least 300 miles of its course, but in the lapse of ages its rapid current has cut its bed through all the sedimentary strata, and several hundred feet into the granite base on which they rest.

"For three hundred miles the cut edges of the mesas rise up abruptly, often perpendicularly, forming walls 3,000 feet to over a mile in height. This is the Grand Canyon of the Colorado, the most magnificent geological section, of which we have any knowledge.

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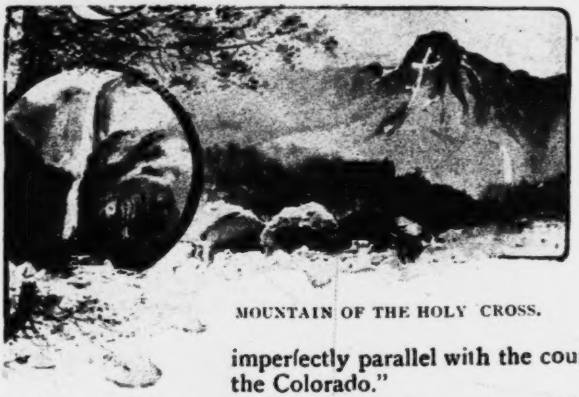
[*] Dr. Newberry, who accompanied Lieut. Joseph C. Ives on his exploration of the Rio Colorado, on the Gulf of California, was one of the first geologists who ever wrote a description of the Grand Canyon. His description is graphic, and at the same time is full of the geological facts which came from his general knowlddge of geology. We, therefore, quote from it extensively.

"The plateau itself, as well as the great canyon, belongs to a vast system of erosion and is wholly due to the action of water. Probably no where in the world has the action of this agent produced results so surprising as regards their magnitude and peculiar character.

"By a glance at the map it will be seen that this great water shed made up of the San Francisco group, the Mogollon, and the spurs of the Rocky Mountains which throw the water into the Colorado from the south, southeast and east, forms a semi-circle imperfectly parallel with the course of the Colorado."



MOUNTAIN OF THE HOLY CROSS.

Dr. Newberry thus speaks of the Moqui country and the district beyond:

> The mesa is geologically and physically the highest which we actually passed over on our route. We seemed to be rising step upon step and mesa upon mesa, until we reached this plateau. At the Moqui villages the strata forming great table lands began to rise toward the east. Near Fort Defiance, the summit has an altitude of 8,000 feet. Here they show the disturbing influence of a more westerly axis of elevation, namely that of the Rocky mountains. In the interval between Fort Defiance and the Rio Grande, the great volcanic mountain, Mount Taylor, like San Francisco mountain, has broken through the crust of the sedimentary rocks and poured their floods of lava over the surface. Beyond this is the valley of the Rio Grande, which runs in a deep gorge between the folds of the mesa, the tributaries to which have cut deep seams, leaving many abrupt tongues of land high peaks, which are called "portreros," among which the Cave-dwellers made their homes. To the east of the Rio Grande rises another plateau which is creased by the wearing of the Pecos river, then come the foothills of the Rocky mountains.

It was across this great plateau that the Spaniards made their way in 1540, and discovered the Grand Canyon.

Professor Winthrop has translated the reports which were made of this expedition by Castaneda, also a letter from Mendoza to the King, and from Coronado to Mendoza, all in the year 1540;* he has also furnished a description of the appearance of the cavalcade. The following is the description :

> It was a splendid array as it passed in review before Mendoza on Sunday morning, February, 1540. The young cavaliers curbed the picked horses from the large stock farms of the viceroy, each resplendent in long blankets flowing to the ground. Each rider held his lance erect while his sword and other weapons hung in their proper places at his side. Some were arrayed in coats-of-mail, polished to shine like that of their general, whose gilded armor, with its brilliant trappings was to bring him many hard blows a few months later. Others wore iron helmets, or visored head pieces, of the tough bull hide for which the country has ever been famous. The footmen carried crossbows and harquebuses, while some of them were armed with bow and shield. Looking on, at these white men, with their weapons of European warfare, was the crowd of native allies, in their paint and holiday attire, armed with the bow and club of the Indian warrior. When all of these started off the next morning, in duly ordered companies, with their banners flying. Upwards of a thousand servants and followers, black men, red men, went with them, leading the spare horses and driving the pack animals bearing the extra baggage of their masters, or herding the large droves of "big and little cattle," of oxen and cows and sheep, and maybe swine, which had been selected by the viceroy to assure fresh food for the army on its march. There were more than a thousand horses in the train of the force, besides mules loaded with camp supplies and provisions, and carrying half a dozen pieces of light artillery--the pedreros or swivel guns of the period.
>
> Coronado entered the wilderness on St. John's eve, and in the quaint language of Hakluyt's translation of the general's letter, "to refresh our former traveiles, the first days we found no grasse but worser way of mountains and badde passages." The first few days of the march were very trying; the discouragements of the men increased with the difficulties of the way, but they proceeded until they came in sight of the Seven Cities. The inhabitants had assembled in a great crowd in front of the place, awaiting the approach of the strangers, Coronado prepared for an assault on the city. The natives showered arrows against the advancing foes, and as the Spaniards approached the walls, stones of all sizes were thrown upon them. The courage and military skill of the white men proved too much for the Indians. They were driven from the main portion of the town. Food, which they needed a great deal more than gold and silver, was found in the rooms, During the night the Indians packed up what goods they could and left the Spaniards in undisputed possession.
>
> The first expedition toward the east was sent out August 29th, in charge of Alvarado, who reached the river Tiguex (the Rio Grande), September 7. and spent some time in visiting the villages, making headquarters at Tiguex, near the site of the present town of Bernalillo. Alvarado sent to the general the names o' eighty villages, which he had learned from the natives, and reported that these eighty villages were the best that had yet been found. He then proceeded to Cicuye, or Pecos, the most eastern of the walled villages. The first winter spent in the pueblos of New Mexico was a severe one, but the strangers were comfortably domiciled in the best houses of the country, in which the owners left a plentiful supply of food. The natives assumed a hostile attitude, and were subdued only after a protracted stuggle. The army started on its return from Tiguex to Cibola, Culiacan and Mexico in the spring of 1542.

Coronado found no gold in the land of the "seven cities" or in Quivira. Though his search added much to the geographical knowledge of the country, and resulted in the discovery of one of the grandest and most stupendous objects on the American continent, and, in fact, on the globe, namely, the Canyon of the Colorado. He fell under the displeasure of the viceroy and sank into obscurity. Owing to these discouraging experiences, the Spaniards for many years paid little attention to New Mexico.

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*See XIVth Annual Report of Bureau of Ethnology;

*"When ill reports of Coronado had been forgotten, there began another Spanish movement into New Mexico and Arizona. In 1581 three Spanish missionaries started from Santa Barbara in Mexico, with an escort of nine Spanish soldiers under command of Francisco Sanchez Chomuscado. They passed up the Rio Grande to where Bernallilo now is, and there the missionaries remained until assassinated by their treacherous flock.

"In the following year Antonio de Espejo, a wealthy native of Cordova, started also from Santa Barbara with fourteen men, to face the deserts and the savages of New Mexico. He marched up the Rio Grande to a point above where Alberquerque now stands. He visited the cities of Sia, Jemez, lofty Acoma Zuni, and the far off Moqui towns, and traveled a long way into northern Arizona. Returning to the Rio Grande, he visited the pueblo of Pecos, which was then inhabited, went down the Pecos river into Texas, and thence crossed back to Santa Barbara.

"In 1590 Gasper Castano de Losa, lieutenant-governor of New Leon, made an expedition into New Mexico, but without the consent of the viceroy. He came up the Rio Grande, but at the pueblo of Santa Domingo was arrested, and was carried home in irons.

"In 1595 Juan de Onate, who may be called the colonizer of New Mexico, and who was a native of Zacetacas, Mexico, and owned rich mines in that region, made a contract with the viceroy of New Spain to colonize New Mexico at his own expense. He made all preparations, and fitted out his costly expedition which had cost him the equivalent of a million of dollars. He took with him four hundred colonists, including two hundred soldiers, with women and children, and herds of sheep and cattle. Taking formal possession of the country, he moved up the Rio Grande to where the hamlet of Chomito now is, and founded San Gabriel, the second town in the United States. He was successful in putting down a revolt at Acoma, and in 1604 marched with thirty men from San Gabriel across the desert to the Gulf of California. In 1605 he founded Santa Fe, the city of the Holy Faith of St. Frances; and in 1606 he made an expedition to the far northeast.

"New Mexico at the beginning of the seventeenth century, after the Spaniards had spent a hundred years of ceaseless exploration and conquest, had hundreds of towns which Spanish missionaries were attempting to civilize.

"The Rio Grande valley, in New Mexico, was beaded with Spanish settlements, from Santa Cruz to below Socorro, 200 miles; and there were also colonies in Taos, in the extreme north of the territory. There had been expeditions, which had penetrated the staked plain, Llano Estacado, to the southeast and others to the far northwest." It is supposed that the region of the Cliff-dwellers was reached.

"There were then 1300 Spaniards on the Rio Grande, all living in Santa Fe or in scattered farm settlements. The life of the colonists was a daily battle with nature, for New Mexico was ever a semi-arid land. They were surrounded with danger, for there were frequent incursions of the cruel Apaches, and there was no rest from the attempts of the Pueblos at insurrection.

"In 1580 the great revolt of the Pueblo tribes occurred. Thirty-four Pueblo towns were engaged in it. It was led by a dangerous Tehua Indian named Pope. Secret rumors had gone from pueblo to pueblo, and the murderous blow fell upon the whole territory simultaneously. Over 400 Spaniards were assassinated, including 21 of the missionaries. Antonio de Otermin was governor of New Mexico. He was attacked in his capital of

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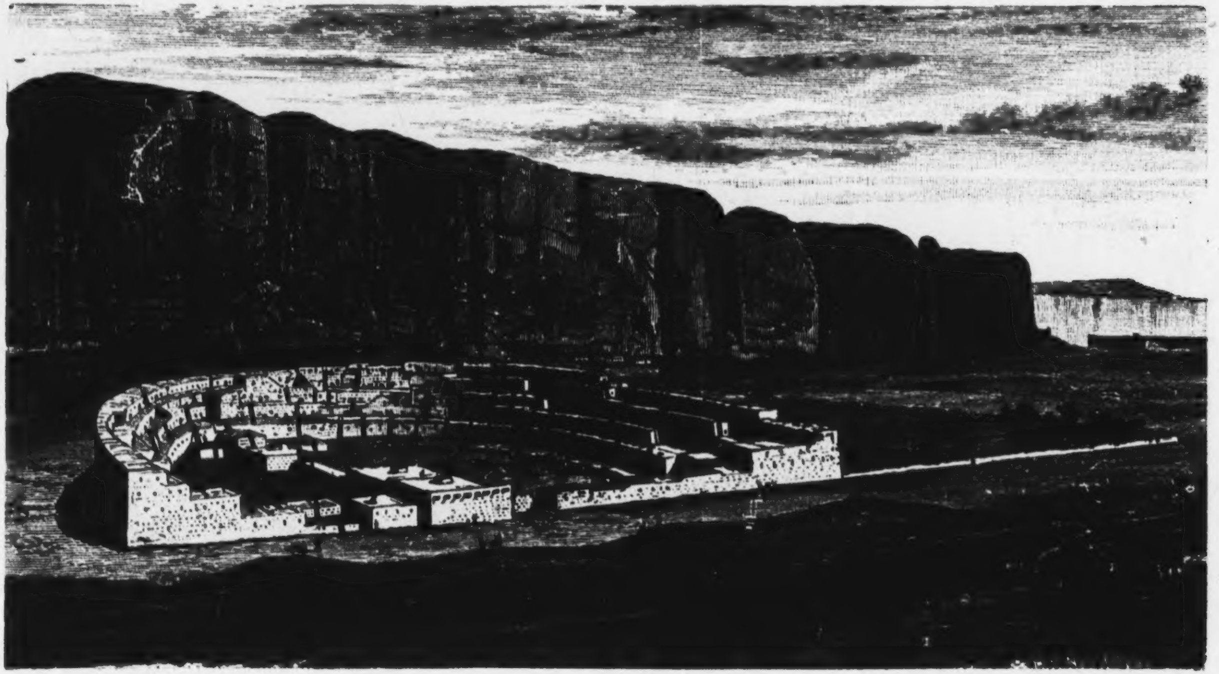
*These quotations are from "The Spanish Pioneers," by Charles F. Lummis.

Courtesy "Land of Sunshine."

THE RUINS OF PECOS.



PUEBLO BONITO RESTORED

> Santa Fe, and 120 Spanish soldiers soon found themselves unable to hold it against their swarming besiegers. After a week's desperate defense, they fled, taking their women and children with them. They retreated down the Rio Grande, and reached the pueblo Isleta in safety, but the village was deserted. The Spaniards were obliged to continue their flight to El Paso, Texas, which was then a Spanish mission.[*]
>
> "For ten years New Mexico was deserted by the Spaniards, though frequent invasions were made from El Paso. In 1692 Diego de Vargas marched to Santa Fe and thence to Moqui with only 89 men. He visited every pueblo in the province, meeting no opposition, but when he undertook to colonize, the Indians gave him the bloodiest reception. Then began the siege of the black mesa of San Ildefonso. De Vargas also stormed the impregnable citadel of the Potrero Viego and the beetling cliff of San Diego de Jemez. These costly lessons kept the Indians quiet until 1696, when they broke out again in revolt, but were soon subdued. Then came a dismal hundred years of ceaseless harassment by the Apaches, Navajos and Comanches, and occasionally by the Utes,
>
> The Indian wars were constant, but the explorations by the Spaniards were frequent. They extended into Texas and settlement soon followed. The Spanish colonization of Colorado was slow, and they had no towns north of the Arkansas river. In Arizona, a Jesuit mission was established and continued from 1689 to 1717. Father Franciscus Eusebius Kuehne made four journeys on foot from Sonora to the Gila, and descended that stream to its junction with the Colorado."

The Spaniards, notwithstanding their long residence and extensive acquaintance with the Pueblo territory, never discovered the cliff dwellings, or if they did, they never made a record of them. There was an expedition towards the northern part of the territory and beyond, which led very near to them, but did not result in their discovery. It was conducted by two Franciscan Friars, Dominquez and Escalante, who in 1776 started out from Santa Fe for the purpose of discovering the route to Monterey, and to California and the sea.

The party consisted of the two priests and five soldiers They took the road to Abiquieu and the Rio Chama, and reached a point called Nueves on the San Juan, three leagues below the junction of the Navajo. They crossed the San Juan, passed down the north bank, north of the Colorado line, and found themselves on a branch of the San Juan some distance north of the Mancos canyon, and on the 12th day of May encamped on the Dolores. This part of their route was in the neighborhood of the cliff dwellings, but they did not seem to have gained any knowledge of them. The beginning of their route was the same as the old Spanish trail from Santa Fe to Los Angeles. They afterward took a route which was about the same as the Spanish trail from Santa Fe to the Salt Lake,—the same trail that Captain Macomb followed in his survey. On the 23rd of May they left the San Pedro and passed northeest to the Rio San Francisco, and camped in a rancheria of Utes, and sought to secure a guide to the Lagunas, or Timpanagos, where they had been told to look for Pueblo towns. Pursuing a northwest course they crossed the San Raphael, or Colorado, where were signs of buffalo. They crossed the San Benaventura, which was the boundary between the Utes and the Comanches, at a place called Santa Cruz. From this point they went westward and came in sight of the Lake of the Timpanagos, now named Utah Lake.

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[*] The revolt of 1680 seems to have resulted in the temporary abandonment of the country by the Spaniards but was followed by a great reduction of the native population in the entire abandonment of many of their pueblos. Nearly all the Queres villages below San Felipe were abandoned, and new villages were erected below El Paso which bear the same name as the old. At the present there is but a single village at Jemez, that on the rock which was so long beseiged by the Spaniards. There were at Tiguex, in Coronado's time, eleven villages; at present Bernallillo is the only town. It lies 5,084 feet above the sea, but the Sandia Mountain, five miles west, is 10,069 feet high and descends almost perpendicularly.

There were here no town builders like the Moquis and Zunis, as the priests had been told, but there were many wild Indians. These Indians gave the priests a kind of heiroglyphic paintings on deer skin to show them their desire to adopt the christian faith. The Utes dwelt in huts made of osiers. They made their utensils of the same material. The Comanches lived in huts made from grass and earth,—the latter of which forms the roof. The Utes wear clothes made from the skins of bears and antelopes.

The party abandoned the hope of reaching the sea, and they turned southwest and reached the Beaver river, which is now called Escalante river. They returned by way of the Moqui villages and reached Santa Fe after an absence of about four months.

These various explorations by the Spaniards, bring to view the territory which was occupied by the pueblos; a territory which is now divided up into four states, New Mexico, Arizona, Colorado and Utah, and is traversed by two great rivers, the Rio Grande on the east and the Colorado and its branches on the west, and in a general way is bounded by four others: Pecos on the east, Dolores on the north, Colorado on the west, and the Gila on the south.

The Rio Grande was the river on which the largest number of inhabited pueblos were found, as it was the river on which the largest number of Spanish missions were established. These missions resulted in the erection of large churches in all the prominent places, many of which are still standing, though in ruins, and are often mistaken by tourists and travellers for prehistoric structures. The history of these churches will be appropriate here.

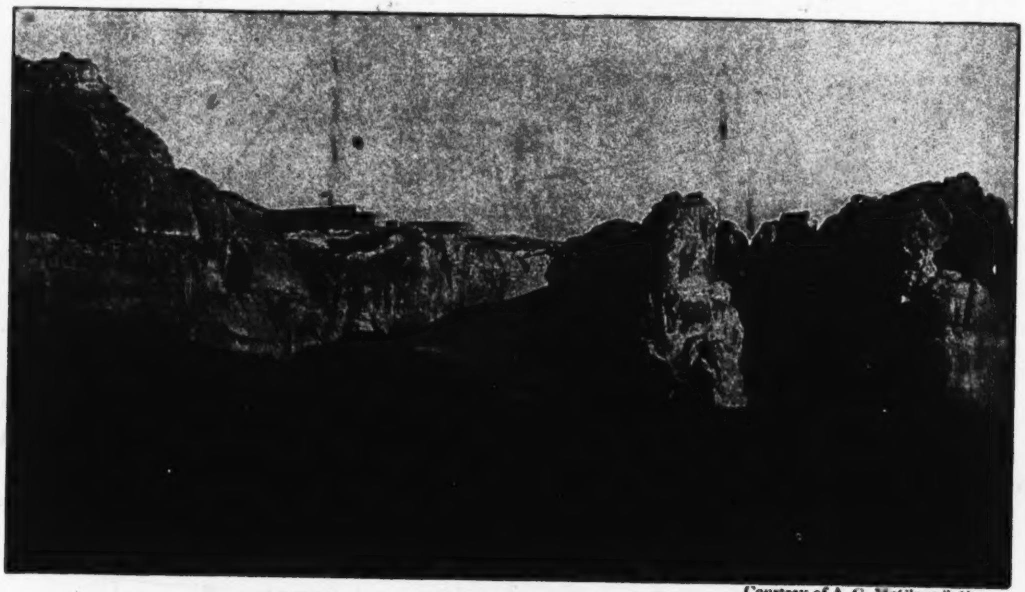
Mr. C. F. Lummis has written a chapter on church builders. The following are extracts from his very interesting book, "The Spanish Pioneers:"

The first church in New Mexico, at San Gabriel, was founded in September 1598, by the ten missionaries who accompanied Juan de Onate. In 1608 a church was erected at Santa Fe.

In 1617, three years before Plymouth Rock, there were already eleven churches in use in New Mexico, viz: at the dangerous Indian pueblos Pecos and Galisteo, on the east; one in the far north at Taos, two at Jemez, one hundred miles west of Santa Fe in an appalling wilderness, and others at nearly all of the large towns. It was a wonderful achievement, for each lonely missionary so soon to have induced his barbarous flock to build a big stone church and worship there the new white God.

The churches in the two Jemez pueblos had to be abandoned about 1622, on account of the harassment by the Navajos, but were occupied again in 1626. At Zuni, far west of the river and three hundred miles from Santa

RUINED CHURCH AT PECOS.



Courtesy of A. C. McClurg & Co.

CHURCH AND PUEBLO ON THE ROCK OF ACOMA.

Fe, the missionaries had established themselves as early as 1629, and in the same period they built three churches among the wonderful cliff towns of Moqui. Down the Rio Grande there was a similar activity. At the ancient pueblo of San Antonio a church was founded in 1629, and another at the pueblo Nuestea Senora, now Soccorro. The church in the pueblo of Picures, in the northern mountains, was built before 1632, and the one at Isleta, in the center of New Mexico, was built before 1635; one at Nambe in 1642.

In 1662 a church was built at El Paso del Norte, a dangerous frontier mission, hundreds of miles from Spanish settlements in Old and New Mexico.

One can see from the windows of the train on the Santa Fe route, a large adobe ruin. It is the old church of the pueblo of Pecos,* whose walls were reared 275 years ago. The pueblo was the largest in New Mexico, but was deserted in 1840. Its great quadrangle of many storied Indian houses is in utter ruin, but above their gray mounds still tower the walls of the old church.

The missionaries also crossed the mountains east of the Rio Grande and established missions among the Pueblos who dwelt on the edge of the Great Plains.

The churches at Cuarai, Abo and Tabira are the grandest ruins in the United States, and were built between 1660 and 1670, and about the same time as the churches at Tajique and Chilili. Besides all these the pueblos of Zia, Santa Ana, Tsuque, Projoaque, San Juan, San Marcos, San Lazaro, San Cristobal, Alameda, Santa Cruz, and Cochiti, had each a church by 1680. A century before our nation was born, the Spanish had built, in one of our territories, half a hundred permanent churches, nearly all of stone and some of them of immense proportions.

This great zeal in building churches, taken in connection with the oppressions of the Spanish, resulted in the frequent murdering of the missionaries, and finally in the revolt of 1680. It was almost a habit with the natives to kill the missionaries. It was not the sin of one or two towns but nearly all, for twenty different towns, at one time or another, murdered their respective missionaries. Some towns repeated the crime several times. Up to the year 1700, forty of these quiet heroes in gray had been slain in New Mexico,—two by the Apaches, but the rest by their own flock.

This plan of building massive churches and bringing the natives, who had been for centuries accustomed to the worship of the "rain god" in their estufas or subterranean chambers, to the severe tasks of erecting and supporting them, was in violation to the traditions of the people and contrary to all their habits.

The celebrated Dr. Flinders W. Petrie has said:

The civilization of any race is not a system which can be changed at will. To alter such a system, apart from its conditions, is impossibe. Every civilization is the growing product of a very complex set of conditions, depending on race and character, on climate, on trade, and every minutia of the circumstances. Whenever a total change is made in government it breaks down altogether, and a resort to a despotism of one man is the result. We may despotically force a bold and senseless imitation of our way on another people, but we should only destroy their light without implanting any vitality in its place. No change is beneficial to the real character of a people except what flows from conviction, and a natural growth of the mind.

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*We have given a plate which illustrates the size and shape of the church which remains in ruins at Pecos, of which Mr. Lummis has given a description. It has been kindly loaned to us by Messrs. A. C. McClurg & Co.

The Rock of Acoma, which is also represented in the plate, is surmounted by an ancient pueblo, in the midst of which is another massive church building which rises above the walls of the pueblo and is the most prominent object in the landscape.

Mr. C. F. Lummis, in his volume "Poco Tempo," has given several cuts of the churches at Tabira, Abo and Cuarai.

Such a system, the product of such extreme conditions, we attempt to force on the least developed races and expect from them an implicit subservience to our illogical law, and our inconsistent morality,—the result is death: we make a dead house and call it civilization. Scarcely a single race can bare the contact and the burdens, and then we talk complacently about the continued decay of savages before white men.

It was inevitable that frequent revolts should occur, and that full submission to the dominion of the Spanish should never take place, though there was an ostensible practice of the religious rites and ceremonies, yet the old pagan or aboriginal system continued and survives to the present day.

It is a singular fact that, notwithstanding the efforts of Spanish missionaries to civilize and christianize the natives, there was a very rapid decline in the population and a decrease in the number of the inhabited pueblos. This has been accounted for, in part, by the incursions of the savage tribes who dwelt upon the borders of the pueblo territory,—the Navajos, the Apaches, the Utes and the Comanches,—offshoots of the Athapascan and Shoshonian stock, which originally came from the north. These tribes had beset the region, especially the western and northern part, before the arrival of the Spaniards, and had compelled the people who were dwelling in the pueblos and were cultivating the soil in the valleys of the San Juan and elsewhere, to build their houses in the cliffs as a matter of defense. They afterward drove them from their retreats and compelled them to find refuge among the tribes farther south. The date of this migration of the Cliff-dwellers is unknown, but it was probably before the arrival of the Spaniards. The attack of these wild tribes was so persistent that all the north and western part of the Pueblo territory had been abandoned, and the great villages which were situated in the valley of the Gila, as well as the cliff dwellings on the San Juan, the Rio de Chelly and the Rio Verde, as well as the pueblos on the Chaco, were in ruins.

The Spanish writers make no mention of villages situated in these valleys, nor did they send any missionaries there or build any churches. It seems that only a very small portion of the pueblo territory was occupied at the time of the arrival of the Spanish, and even that became decimated and some of it depopulated while the Spaniards were occupying it. It has been questioned whether there was a decrease in the population, but we have evidence furnished by the Spanish explorers themselves. In 1582 Antonio de Espejo made his expedition up the Rio Grande. In his report he gives the list of villages reached and the population of each.

The population of these towns was very much over estimated by Espejo, but the number of inhabited pueblos* was in great contrast with those mentioned by the American explorers.[*] Not one of these villages probably contained over 1,000 people. The population, estimated by the Spaniards at from 25,000 to 250,000, is not now over 10,000.

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*The sixty inhabited pueblos which were discovered by Coronado were reduced to about thirty.

The following table, kindly furnished by Mr. F. W. Hodge, shows the population after the Americans had occupied the country:

| PUEBLOS. | Reliable. 1850 | Reliable. 1864 | Census. 1889 | PUEBLOS. | Reliable. 1850 | Reliable. 1864 | Censu 1889 |
|---|---|---|---|---|---|---|---|
| Acoma | 350 | 491 | 582 | San Felipe | 800 | 427 | 501 |
| Cochiti | 254 | 229 | 300 | San Ildefonso | 500 | 161 | 189 |
| Isleta | 751 | 786 | 1037 | San Juan | 568 | 385 | 373 |
| Jemez | 365 | 346 | 474 | Santa Ana | 399 | 298 | 264 |
| Laguna | 749 | 988 | 970 | Santa Clara | 279 | 144 | 187 |
| Nambe | 111 | 94 | 81 | Santo Domingo | 666 | 604 | 930 |
| Pecos* | | | | Sia | 124 | 103 | 113 |
| Picuris | 222 | 122 | 120 | Taos | 361 | 361 | 324 |
| Pajoaque | 48 | 29 | 18 | Tesuque | 119 | 101 | 94 |
| Sandia | 241 | 197 | 150 | Zuni† | ? | ? | 1547 |

*Moved to Jemez 1840. †Population 1,470 in 1805.

Later figures from Census Report—including Moki.

There was nothing in the Spanish regime which secured defense to the people against their enemies. Only when there was a revolt among the Pueblo tribes themselves, did they bring in the force of arms to protect themselves. The people had learned to economize in wood and water, and had ways of erecting their own buildings and irrigating their own villages, which were well adapted to a semi-arid region. They gathered the rain water which fell upon the surface into reservoirs, led it through the center of the villages, afterwards conducted it through the gateways into other reservoirs, and there used it to irrigate their fields.[†]

They sometimes built their houses on mesas, which were reached by single pathways, as may be seen in the village of Acoma, which, with Isleta and Oraibe, are the oldest pueblos in the region and the only ones that remain in the same sites as they did when discovered by Coronado. They were thus able to endure the attacks of the savages, though they allowed tribes, such as the Queres[*] and Navajos,to drift in from the outside regions, who adopted the Pueblo style of building and conformed to the common mode of life.

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[*] Bandelier says: "The villages of that time (first half of the sixteenth century) were on an average much smaller than those of to-day inhabited by Pueblo Indians, but there was a greater number of them. The aggregate population of the Pueblos in the sixteenth and seventeenth centuries did not exceed 25,000 souls."

Mr. Cushing says: "At the time of the Spanish conquest the Pueblo Indians numbered, all told, more than 30,000. . . . The total population of the modern towns is about 10,000."

Not one of these villages contained over 1,000 people.

Mr. M. L. Miller says: "The population of Taos in 1864 was 361. The number of the Pueblo Indians at the time of their discovery has been variously estimated. The largest estimate is that of Antonio de Espejo, whose total figures for all the Pueblos would give about 250,000." From this number the estimates run all the way down to 23,000. Vetancurt gives the figures for the year 1660 at a little over 23,000.

[†] The ruins of Pecos which are presented in the two plates illustrate this, as do the inhabited villages of Taos.

The Pueblos had a system of worship which was peculiar to the region. They worshipped the nature powers and the "rain god"[†] under the symbol of the serpent, and had many ceremonies which were founded upon this system. Every part of their domain, including the rocks, the springs, the mountains and lakes, were sacred to their divinities. Even their method of reckoning time was by watching the sun in its course, and noticing its position over certain heights.

It was not strange that the people revolted. They were obliged to carry heavy timbers long distances to put into the massive churches erected in every village where there was a mission. The difficulty of this task can be imagined when we look at the picture of the great church which overshadows, by its height, the pueblo on the summit of Acoma.[‡] The old clan life, and the rule of the Caciques, was interfered with. Time honored institutions and customs were broken up. The rule of the priests was substituted for that of the hereditary chiefs and "medicine men."

It was not altogether owing to the attack of the savages that the pueblos were deserted; but to the oppressions of the Spaniards, which continued for three hundred years, the only relief to which was the Mexican war in 1846 and their transfer to the American power. To this the Pueblo tribes gave their adherence at the first, and have ever since manifested the most friendly feeling.

When the Americans began their explorations there was very little of the territory inhabited.[‖] All this is, however, in great contrast to that which has occurred since the Americans began to occupy the country.

The American exploration may be divided into a number of periods which followed one another, according to succession or order of time; each of which has produced important results.

The first series began with the capture of General Pike and his trip across the country to Mexico, and ended with the trading expeditions of J. W. Gregg.[§]

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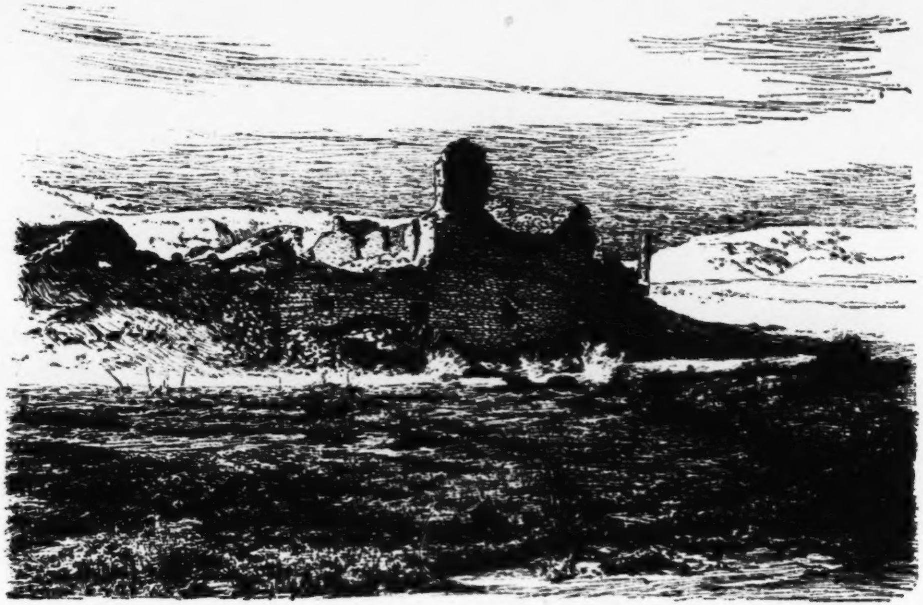
[*] The Queres, according to Mr. C. F. Lummis, made their homes among the potreros west of the Rio Grande, and were the cave-dwellers of this region. They are said to have erected the stone effigies, which were probably their totems, thus showing that they were originally totemistic animal worshippers and not sun worshippers like the Pueblos. One branch of them built the village on the summit of the rock Acoma. Another branch occupied Santa Ana, Santo Domingo San Felipe and Cochiti on the Rio Grande.

[†] See book on Myths and Symbols.

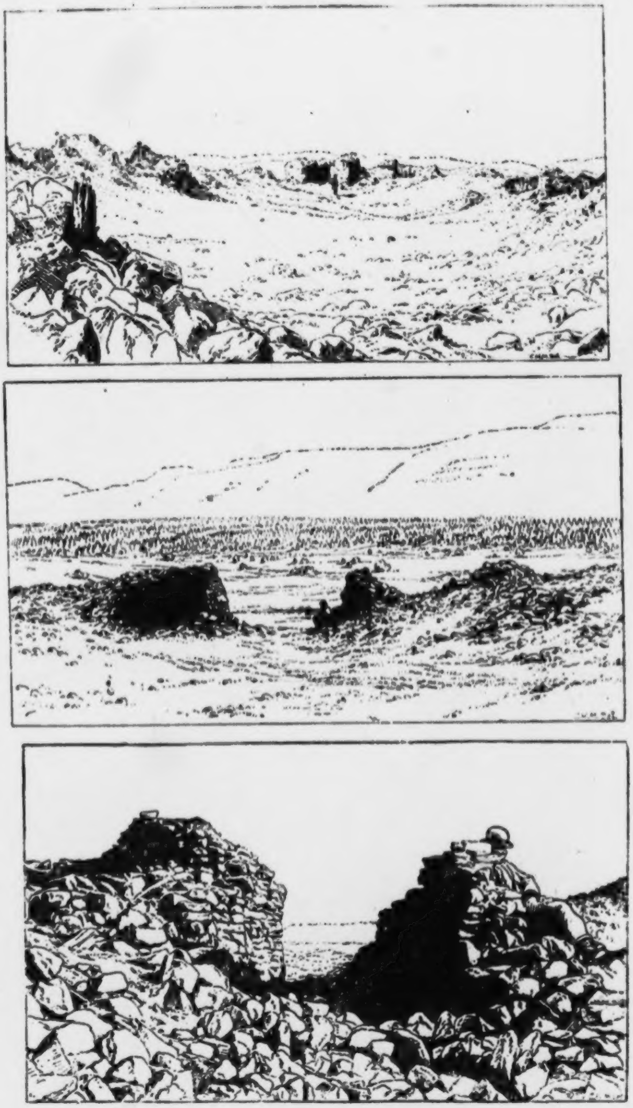
[‡] See Plate.

[‖] Acoma, Laguna, Zuni and the Moqui pueblos were about all the villages west of the Rio Grande which were inhabited.

[§] From "Pike's Narrative" we learn that James Pursley fell in with some Indians on the Platte river and passed over to the Grand river and descended, in 1805, to Santa Fe. In 1812 an expedition under McKnight, Beard and Chambers succeeded in reaching Santa Fe. In 1821 Capt. Beckwell, with four trusty companions, went to Santa Fe. In 1822 Santa Fe trade began; Col. Marmaduke, Lieut.-Governor of Missouri, made one of a party who went with twenty-five wheeled carriages to Santa Fe.



RUINED PUEBLO ON THE CHACO.



RUINED PUEBLO AT PECOS.

The second began with the expedition sent out by the government under the charge of Colonel Washington and Lieutenant Simpson,[*] to examine into the condition of the Navajo Indians, but included the expedition under General Sitgreaves and Lieutenant Ives, who were to report on the navigability of the Colorado river, but ended with the preliminary survey of the Pacific railroad under Major Whipple.

The third series began with the organization of the Geological surveys under Prof. F. V. Hayden and Major Wheeler, and included the explorations[†] by W. H Holmes, W. H. Jackson, Oscar Loew, Prof. E. D. Cope and Dr. W. H. Hoffman. This exploration resulted in the discovery of the cliff dwellings in the Mancos canyon, the shelter caves, the Montezuma canyon, ancient pueblos on the McElmo and the remarkable fortress called Montezuma Castle.

The fourth series began with the organization of the Ethnological bureau,[‡] and includes the expeditions sent out under the auspices of the Archæological Institute of America, conducted by A. F. Bandelier, the Hemenway expedition, and the reports made by F. H. Cushing, J. Walter Fewkes and Dr. Washington Mathews.

The fifth series consisted of explorations of private individuals who have visited the regions of the Cliff-dwellers, among whom are F. H. Chapin, Dr. Beardsall, L. F. Bickford, Mr. Nordenskjold, C. F. Lummis, W. K. Moorhead and Lewis W. Gunckel.[‖]

Each one of these expeditions marks an era in the history of the pueblo region since the time of American occupation, which is distinguished not so much for the changes among the pueblos themselves, as by the progress of the country in all that makes for peace and prosperity. Very little was known at the outset about the country except that it was overrun by savages. It was only the regions beyond and the gold mines of California that at first interested the people, but it was afterward found that the country was rich in minerals and only needed enterprise and energy to bring out its resources. There was great danger in traveling and it was not safe for Americans to settle there. It was not long before the government subdued the hostiles and brought the whole country under the strong power of law.

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[*] This brought to light the wonderful ruins in the valley of the Chaco and the Rio de Chelly, the Rock Inscriptions at Zuni, and furnished an account of the inhabited pueblos of Zuni, Laguna and the villages on the Rio Grande. The expedition under Captain Macomb was attended by Prof. J. S. Newberry, They passed up the Colorado river, reached the Grand Canyon, crossed the plateau to the Moqui villages, and from there to the Dolores and to the river Chama, but did not reach the ruins in the valley of the Chaco. Major Whipple traversed the same route which had been previously followed by J. W. Gregg, by way of the Canadian river and the Shawnee settlements, Walnut Creek to Albuquerque and from thence to Laguna, Zuni, Rio Pascado, Rio Verde, Aztec Pass, Bill Williams' Forks to the Colorado river. A special report was made by Lieutenant Abert, which gave the names of the Indian tribes and their number.

[†] The results of this exploration were very remarkable and should be mentioned seriatim. [1.] The Cliff Dwellings, situated high up on the sides of the cliffs of the Mancos canyon, were discovered by W. H. Jackson. The cliff villages, such as Echo Cave on the Mancos, on the Rio de Chelley, on the San Juan, were described by W. H. Holmes. [2.] The ruined pueblos situated on the McElmo, the Dolores and the Hovenwep, the most of which were of the honey-comb pattern. [3.] The cavate houses, with towers above them and walled up caves, which were used for caches or store rooms for grain. [4.] The cliff fortresses, called Montezuma Castle and that of Montezuma Wells, discovered by Dr. W. H. Hoffman. [5.] The single houses situated at a distance from water, discovered by Prof. E. D. Cope. [6.] The ruins of pueblos on the Animas, described by Lieut. Rogers Birnie. [7.] The Rock Inscriptions which were discovered in the Shelter caves. [8.] The pottery and other relics, described by E. A. Barber and W. H. Holmes. [9] The revisiting of the ruins of Chaco canyon by W. H. Jackson. [10.] The account of the Pueblo languages by A. S. Gatschet, and the classification of the tribes according to languages, by Oscar Loew.

[‡] This bureau was established in 1879 after the famous exploration of the Grand Canyon of Colorado by Maj. J. W. Powell. The general review of the field explored has been published by Major Powell in various magazines, and in a recent book called the Canyon of Colorado, published by Ford & Vincent.

[‖] Mr. L. F. Bickford has described the ruins on the Chaco and on the Rio Verde in the Century magazine for October 1890. Dr. Mearns, surgeon United States army, described the ruins on the Rio Verde and the fortress called Casa Blanco in the Popular Science Monthly for October 1890. Dr. J. F. Beardsall describes the cliff dwellings in Mancos canyon in the Bulletin of Geographial Society, republished in the American Antiquarian. Messrs. Moorhead and Gunckel furnish descriptions of the shelter caves and cave villages in the Butlers-wash and other canyons in the Illustrated American, also in THE AMERICAN ANTIQUARIAN.

Interest was awakened when it was discovered that there were so many ruins hid away in the valleys and the deep canyons, and America began to appear like an ancient country. A vast amount of information concerning the Indian tribes, and especially the Pueblos, began to come in, and the Indians instead of proving to be mere vagrants hardly worthy of notice and only to be exterminated as soon as possible, were shown to have had a remarkable system of government, a wonderful amount of mythology and folklore, and also elaborate ceremonial and religious rites, which were worthy of the closest attention.

The study of the architecture, languages and the customs of the Pueblo Indians, were owing to the personal interest in archæology which some of the explorers felt, and the reports were altogether voluntary, but the contributions have increased in number and value as time has passed on. It is with this point in view that we shall quote freely from the reports of the different explorers, taking those which were early and late and arranging them so as to bring out the facts in reference to particular localities.

The various parties which explored the region began at the east side and went westward in the opposite direction from that taken by the Spaniards. They reached first the inhabited pueblos situated upon the Rio Grande, and only came upon the ruins as they approached the western borders. Some of the expeditions took the central route and followed the old trail which was the continuation of the Santa Fe trail; consequently they came first to the pueblos which were already known, such as San Domingo, Acoma and Zuni. Still some of the earlier explorers were able to reach the ruined pueblos and cliff dwellings which were totally unknown, and made reports which were very startling.*

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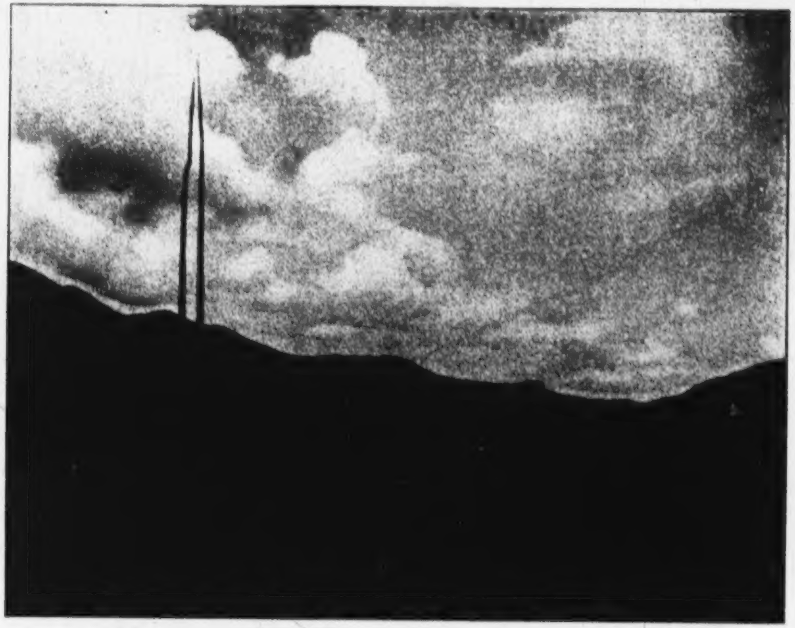
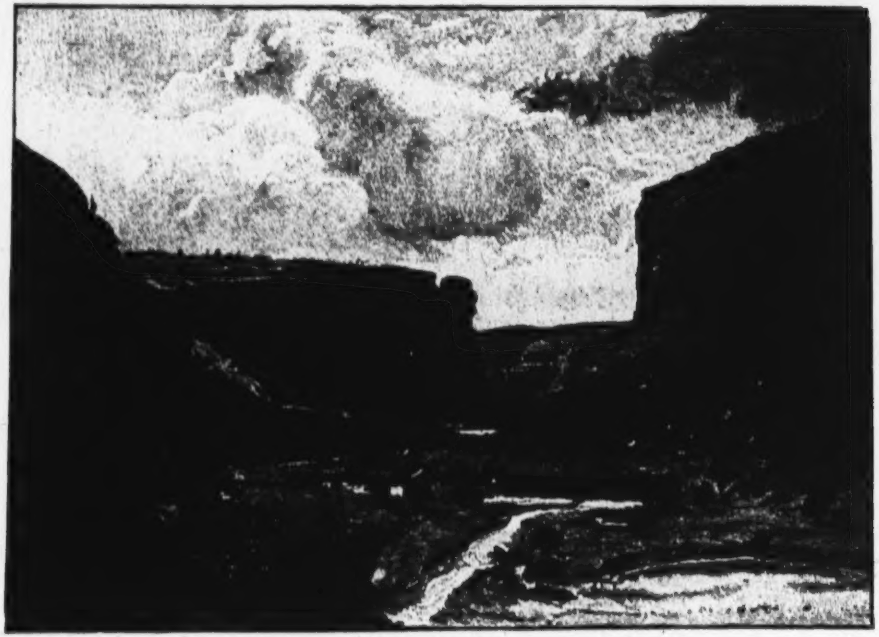
*Sitgreaves came upon ruins of stone houses which he says were evidently remains of a large town, as they secur at intervals for an extent of eight or nine miles,—but probably the same as visited by Cushing, Walter Fewkes and others,—situated upon the Rio Gila, and his guide Lereux passed from the Gila over to the Rio Verde and discovered some of the cliff dwellings which have so recently been described by Mr. Mindeliff.



THE ESTUFA AT TAOS.



SCENE ON THE RIO DE CHELLY.

The descriptions furnished by the different exploring parties form a most suggestive series of discoveries.

1. We begin with the easternmost district, namely, that on the Rio Grande: a district in which there were many inhabited pueblos. These have furnished the chief data for reconstructing the pueblos farther west, which are in ruins, and for deciding as to the state of society which formerly existed throughout the entire region. The American explorers have done far more in this direction than the Spaniards did, notwithstanding their excellent opportunities, and the information as to the inner systems and hidden rites which were practiced in the estufas, and many other things, is constantly being secured.

The first one to describe the pueblos of this region was Mr. Josiah Gregg, who visited the pueblos of Taos, Pecos, Isleta, San Domingo and Felipe and described their peculiarities. After speaking of the villages and their acequias, or irrigating ditches, and the population in the villages, and the ancient mines, and ruined cities called La gran Quivira, and the traditions concerning them, he describes particular places. He says:

> Ancient ruins are now to be seen scattered in every quarter of the territory. Of some, entire stone walls are yet standing, while others are nearly obliterated. Each pueblo is under the control of a cacique, chosen from among their own sages and commissioned by the governor of New Mexico. The cacique, when any public business is transacted, collects together the principal chiefs of the pueblo in an estufa and laying before them the subject of debate, which is generally settled by a majority.
>
> The Pueblo villages are generally built with more regularity than those of the Mexican, and are constructed of the same materials as were used by them in the most primitive ages. A very curious feature in these buildings is, that there is most generally no direct communication between the street and the lower rooms, into which they descend by a trap-door from the upper story, the latter being accessible by means of ladders. Even the entrance to the upper stories is frequently at the roof.
>
> Though this was their most usual style of architecture, there still exists the pueblo of Taos, composed for the most part, of but two edifices of very singular structure one on each side of a creek, and formerly communicating by a bridge. The base story is a mass of near four hundred feet long, a hundred and fifty wide, and divided into numerous apartments, upon which other tiers of rooms are built, one above another, drawn in by regular grades, forming a pyramidal pile fifty or sixty feet high, and comprising some six or eight stories. The outer rooms only seem to be used for dwellings, and are lighted by little windows in the sides, but are entered through trap-doors in the roofs. Most of the inner apartments are employed as granaries and store-rooms, but a spacious hall in the centre of the mass, known as the estufa, is reserved for their secret councils. These two buildings afford habitations, as is said, for over six hundred souls. There is likewise an edifice in the pueblo of Picuries of the same class, and some of those of Moqui are also said to be similar.
>
> Some of these villages were built upon rocky eminences deemed almost inaccessible; witness, for instance, the ruins of the ancient pueblo of San Felipe, which may be seen towering upon the very verge of a precipice several hundred feet high, whose base is washed by the swift current of the Rio del Norte. The still existing pueblo of Acoma also stands upon an isolated mound, whose whole area is occupied by the village, being fringed all around by a precipitous cliff.

Several gentlemen have visited this pueblo (Taos) since the time that Mr. Gregg made his expeditions, and have given descriptions of it.

The best description is given by Mr. L. H. Morgan. He says:

> The two structures stand about twenty-five rods apart on opposite sides of the stream and facing each other. That upon the north side is about 250 feet long and 130 feet deep and five stories high; that on the south side is shorter and deeper and six stories high. The present population is about 400, divided between the two houses. Upon the east side there is an adobe wall connecting the two buildings and protecting the open space. The creek is bordered on both sides by ample fields and gardens, which are irrigated by canals drawing water from the stream. The first stories are built up solid; those above are built in a terraced form; several stories are reached by ladders, the rooms are entered by trap-doors. The lower rooms are used for storage and granaries, and the upper for living rooms, the families living above owning and controlling the rooms below. Several rooms were measured, and found to be in feet 14x18, 20x22 and 24x27, the height of the ceiling from 7 to 8 feet. In the second story they measured 14x23, 12x20 and 15x20. The back rooms have usually one or more round holes made through the walls, from six to eight inches in diameter, these furnish the apartment with a scanty supply of light and air. The ground rooms are usually without doors or windows, their only entrance being through the scuttle-holes which are in the rooms comprising the story above. The rooms located in the front part of the house receive the light from the doors and windows; the back rooms have no other light than that which goes through the scuttle-holes or holes in the wall, and they are always gloomy.
>
> The representation of a room in this pueblo is from a sketch by Mr. Galbraith, who accompanied Major Powell's party. There are fire-places in this room, a modern invention. [See plate.]
>
> There is room in each of the two buildings to accommodate 500 people. They were occupied in 1864 by 361 Taos Indians. From the best information attainable, the original buildings were not erected all at one time, but added to from time to time.

The description which is furnished by Mr. M. L. Miller, who has spent a summer at Taos, is especially worthy of notice. He says:

> The question of location is, apart from another question, whether the people are to-day living in the same buildings which the Spaniards saw. Mr. Bandelier positively states that, 'with the exception of Acoma, there is not a single pueblo standing where it was at the time of Coronado, or even sixty years later, when Juan de Onate accomplished the peaceful reduction of the New Mexican Village Indians.'
>
> Taos appears several times prominently in opposition to the Spaniards; the last time when the people gave any trouble was at the time of the Taos rebellion in 1847. The ruins of the church in which the people made their last stand against the whites are still at Taos. There are also ruins near Taos which indicate that there has been a rebuilding of the pueblos even here.
>
> Of the high houses at Taos there are two, the north house is five stories high and the south but four stories. [See plates.] The two main houses sheltered the entire tribe originally, but later small groups of buildings have been built within the old wall and outside. Mr. Lummis speaks of the houses as pryamids, and so they appear, for they recede by four or five great steps to the top. The ground floor covers, according to Mr. Davis, about three or four hundred feet by one hundred and fifty feet for each building. In ancient times the larger door-ways of the upper terraces were probably never closed except by means of blankets or rabbit skin robes hung over them in cold weather. Examples have been seen where a slight

pole of the same kind as those used in the lintels is built into the masonry of the jambs.

One of the most curious, and at the same time most characteristic features of an Indian pueblo, is its kiva or estufa. At Taos they are circular structures built almost wholly underground and entered by a single opening in the roof. There is no other opening in the room save a small hole at one side to secure a draft for the fire. The subterranean position of these rooms is significant. Mr. Cushing says: 'When the ancestors to the people were living in the caves and cliffs, the women built the houses for the protection of themselves and their children, but the men built sleeping places outside of the caves in front of the houses. The semi-circular form of the villages, to be seen in several of the ruined towns, has not continued in any of the existing pueblos, but the kivas are still subterranean.

'At Taos there are seven kivas, four on the south side of the creek and three on the north side. Some of these are on the outside of the old town wall and others are within the wall. The kivas outside the town wall have the openings surrounded by a wall of adobe about two feet high; one descends by a ladder, the two poles of which extend high up in the air.'

There are many pueblos in the valley of the Rio Grande which, like Taos, have continued to be inhabited. These were visited by the early explorers, General Simpson, Major Whipple and Dr. Oscar Loew, their situation noticed, their population given, and their peculiarities described. Major Whipple secured a map from an Indian on which the pueblos were located, and which represents their mythical home or "place of emergenco."

The most remarkable pueblo is that of Pecos,* situated on the Pecos river. This was inhabited at the time of the arrival of the Spaniards and continued to be inhabited until the year 1840, though its population decreased until only twelve were left; these abandoned the site and went to live at Jemez. The best description of Pecos is given by Mr. A. F. Bandelier; the points which he makes are as follows:

1. It was admirably situated, had an extensive view over the surrounding country. 2. The buildings which surmounted the mesas served as a defense, as the walls formed an obstruction to a storming foe and a permanent abode for the defenders 3. The inclosure surrounded by the buildings served as a reservoir and held the water precipitated on the mesas, which could be conducted to the fields below and made useful for irrigating. 4. The different parts of the house were conformed to the configuration of the rocks, but were all connected so as to be occupied by the different families and clans, and serve as a joint tenement house. 5 Ingress and egress must have taken place, not horizontally "in and out." but vertically "up and down." 6. The surmise is that the family apartments were arranged not longitudinal or in transverse rows but vertically; the rooms of each story communicating with those above and below by means of trap-doors and ladders, - the stores for each family being in the lower story. 7. According to the ground plan and sections it appears that the east wing had five stories, the north two. the west three. and the south four. 8. It was the largest aboriginal structure of stone within the United States, and would even bear comparison with any of the aboriginal ruins of Mexico and Central America. There seems to have been a wall of circumvallation with a total length of 3,220 feet. and about six feet and six inches high on an average. 9. There is but one entrance to it visible, on the west side at its lowest level, where the depression runs down the slope making the bed of a

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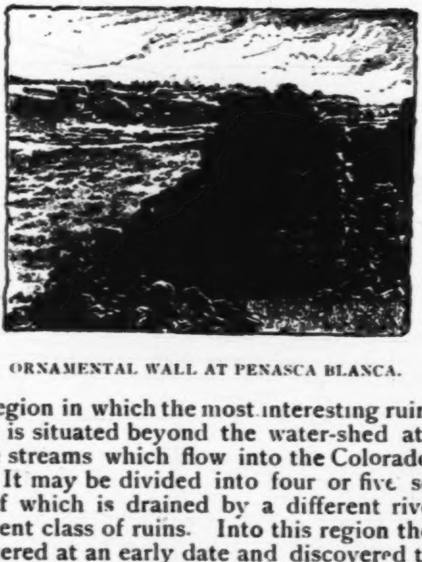
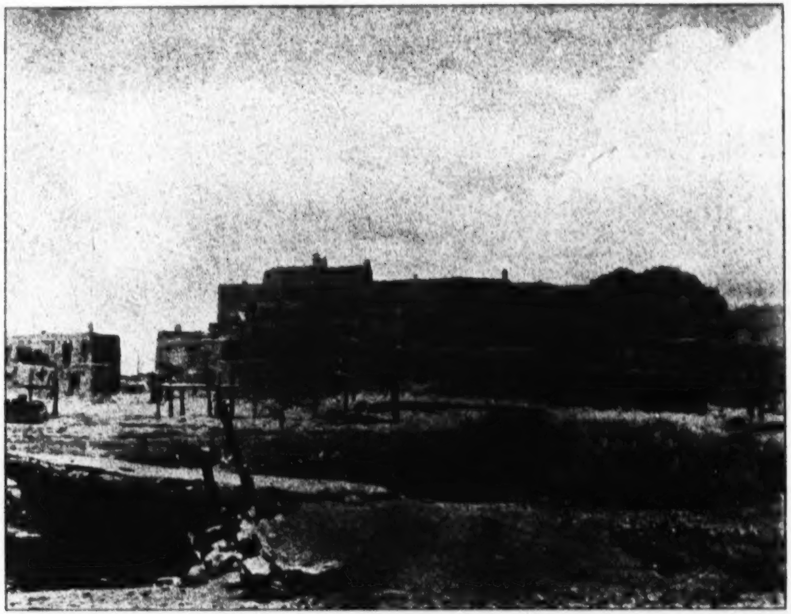
*Of the two plates which illustrate the ruins, one has been kindly loaned by Mr. C. F. Lummis, the other is reproduced from Bandelier's report to the Archæological Institute. These ruins have been described by Josiah W. Gregg and Mr. W. W. H. Davis.

rock streamlet. Here the wall thickens to a round tower built with stones, leaving a gateway thirteen feet wide. 10. There is not in the whole building one single evidence of any great progress in mechanics. Everything done and built within it can be made with the use of a good fair eyesight only, and the implements and arts of what was formerly called the "stone age." This does not exclude the possibility that they had made a certain advance in the mechanical agencies. They may have had the plummet or even the square, but these were not necessary. 11 The structure itself, in its general plan and mode of construction, reminds one of an unusually large honey-comb. 12. Not a vestige of the former cultivation is left, but the platform with a pond in the center explains their mode of securing the water for irrigation, and gives a forcible illustration of the communal living. The Pecos Indians not only lived together, built their houses together, but raised their crops in one common field, irrigated from one common water source which first gathered its contents within the inhabited surface of the grounds, led into a resorvoir below and so distributed to the fields. 13. The aboriginal ruins in the valley of the Pecos indicates three epochs, successive probably in time. Some of the manufactured ware seemed to have been made by people distinct from the Pecos tribe, though it is similar to that which is met with in the cliff dwellings of Mancos canyon.



ORNAMENTAL WALL AT PENASCA BLANCA.

II. The region in which the most interesting ruins are found is that which is situated beyond the water-shed at the headwaters of the streams which flow into the Colorado, and so to the Pacific. It may be divided into four or five separate districts, each of which is drained by a different river, and presents a different class of ruins. Into this region the American explorers entered at an early date and discovered the most remarkable prehistoric structures in the United States; the most of them in ruins, but a few still inhabited. The inhabited pueblos had been visited frequently by the Spaniards, but the ruins do not seem to have attracted their attention, at least they are not described. In this we see the contrast between the two classes of explorers. The Spaniards, true to their antecedents, sought first for gold, next for religious propogandism. The Americans sought for information and for the improvement of the country. The result is that we have from the Americans a most remarkable series of reports.



PUEBLO AT TAOS.—NORTH BUILDING.

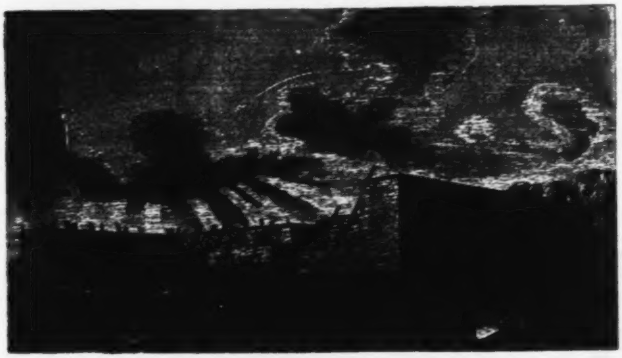
Courtesy Mr. M. L. Miller.

PUEBLO AT TAOS —SOUTH BUILDING.

Courtesy Mr. M. L. Miller.

It is our purpose to give an account of these discoveries, taking the districts in the order of their discovery as well as that of geographical location; giving credit to each exploring party,—making a special mention of the first discoverers. We shall confine ourselves at the present to the ruins found on the Chaco river. This region was visited by Lieutenant Simpson in 1849, W. H. Jackson in 1874, and J. T. Bickford in 1890, and described by each in turn. The following is Lieutenant Simpson's description of the ruins, beginning with those of Pintado, the easternmost of the group:

> We found them to more than answer our expectations, forming one structure and built of tabular pieces of hard, fine-grained, compact, gray sand-stone (a material unknown in the present architecture of New Mexico), to which the atmosphere has imparted a reddish tinge, the layers or beds being not thicker than three inches, and sometimes as thin as one-fourth of an inch, it discovers in the masonry a combination of science and art which can only be referred to a higher stage of civilization and refinement than is discovered in the works of Mexicans or Pueblos of the present day. Indeed, so beautifully diminutive and true are the details of the structure as to cause it, at a little distance, to have all the appearance of a magnificent piece of mosaic work. [See p. 78.]
>
> On the ground floor, exclusive of the out-buildings, are fifty-four apartments, some of them as small as five feet square, and the largest about 12x6 feet. These rooms communicate with each other by very small doors, some of them as contracted as two and a half by two and a half feet; and in the case of the inner suite the doors communicating with the interior court are as small as two and a half by three feet. The principal rooms, or the most in use, on account of their having larger doors and windows, were those of the second story. The system of flooring seems to have been large transverse, unhewn beams six inches in diameter, laid transversely from wall to wall, and then a number of smaller ones, about three inches in diameter, laid longitudinally upon them. On these was placed brush which was covered with a layer of mud and mortar. The beams show no signs of the saw or axe. On the contrary, they appear to have been hacked off by some very imperfect instrument. At different points about the premises were three circular apartments, sunk in the ground, called estufas, where the people held their religious and political meetings.



HUNGO PAVIE RESTORED.

Thirteen miles from our last camp we came to another old ruin called Pueblo Weje-gi.

Further down the canyon we came to another pueblo in ruins, called Hungo Pavie. These ruins show the same nicety in the details of their masonry as those already described. The ground plan shows an extent of exterior development of 1,872 feet, and a number of rooms upon the ground floor equal to 72 feet. The structure shows but one circular estufa, and this is placed in the body of the north portion of the building, midway from either extremity. This estufa differs from others, having a number of interior *counterforts*. The main walls of the building are, at the base, two and three-fourths feet through, and at this time show a height of about thirty feet. The ends of the floor beams, still visible, show that there was, originally, at least, a vertical series of four floors. The floor beams, which are round, in transverse section, and eleven inches in diameter, as well as the windows, which are as small as 12x13 inches, have been arranged horizontally, with great precission and regularity.

Continuing down the canyon one and three quarter miles further, we came to another structure in ruins, the name of which, according to the guide, is Pueblo Chettro Kettle, or, as he interprets it, the "Rain Pueblo." These ruins have an extent of exterior circuit, inclusive of the court, of about 1,300 feet. The material of which the structure has been made, as also the style of the masonry, is the same as that of the ruined pueblos already described,—the stone a sandstone, the beams pine and cedar, and the number of stories at present discoverable is four, there having been originally a series of windows (four and a half by three and a half feet) in the first story, which are now walled up. The number of rooms on the first floor, most all of which were distinguishable, must have been as many as 124. The circular estufas, of which there are six, have a greater depth than any we have seen, and differ from them also in exhibiting more stories, one of them showing certainly two and possibly three, the lowest one appearing to be almost covered up with *debris*. In the northwest corner of this ruin is found a room in almost a perfect state of preservation.

Two or three hundred yards down the canyon we met another old pueblo in ruins, called Pueble Bonito. The circuit of its walls is about 1,300 feet. Its present elevation shows that it had at least four stories of apartments. The number of estufas is four, the largest being sixty feet in diameter, showing two stories in height, and having a present depth of twelve feet. All these estufas are, as in the case of the others I have seen, cylindrical in shape and nicely walled up with thin tabular stone. Among the ruins are several rooms in a very good state of preservation, one of them being walled up with alternate beds of large and small stones, the regularity of the combination producing a very pleasing effect. The ceiling of this room is also more tasteful than any we have seen, the transverse beams being smaller and more numerous, and the longitudinal pieces which rest upon them only about an inch in diameter and beautifully regular.

Two miles further down the canyon, but on its left or south bank, we came to another pueblo in ruins, called by the guide Pueblo de Penasca Blanca, the circuit of which, approximates, 1,700 feet. This is the largest pueblo, in plan, we have seen, and differs from others in the arrangement of the stones composing its walls. The walls of the other pueblos were all of one uniform character in the several beds composing it; but in this there is a regular alternation of large and small stones, the effect of which is both unique and beautiful. The largest stones, which are about one foot in length and one-half foot in thickness, forms but a single bed, and then, alternating with these, are three or four beds of very small stones, each about an inch in thickness. The general plan of the structure also differs from the others in approximating the form of the circle. The number of rooms at present discoverable on the first floor is 112, and the existing walls show that there have been at least three stories of apartments. The number of circular estufas we counted was seven.

## MAP SHOWING DIFFERENT PUEBLO DISTRICTS.

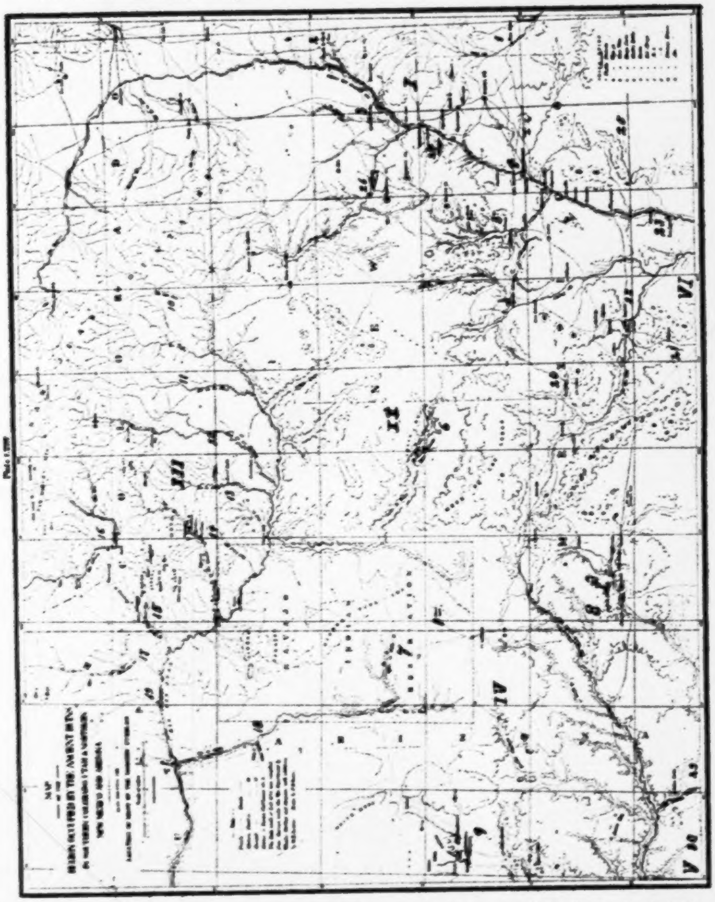
The following map shows the districts represented in the territory visited by the American explorers. They are as follows:

I. The first includes the district on the Rio Grande.

II. The second is situated upon the Chaco, where are the remarkable ruins represented in the cuts, and which are described in this book by Lieutenant Simpson, W. H. Jackson, J. T. Bickford and others.

III. The third is in the valley of San Juan, the McElmo, the Hovenweep, the Mancos, the Montezuma and other streams, and is characterized by the ruins of the cliff dwellings.

IV. The fourth is situated upon the Rio de Chelly, where are the remains of ancient pueblos, cliff fortresses and cliff villages which resemble those on the Mancos and San Juan. It includes the district drained by the Rio Verde on which are the remarkable series of cavate houses, irrigating ditches, ancient boulder cites, stone pueblos and the two cliff dwellings called "Montezuma Castle" and "Montezuma Wells." It includes also the cavate houses and pueblos found in the ancient cones about the San Francisco Mountains.



V. The fifth district is situated upon the Gila River and its tributaries, and includes the ancient ruins of Casa Grande and the scattered villages and irrigating ditches which have been described by Mr. F. H. Cushing and others of the Hemingway expedition.

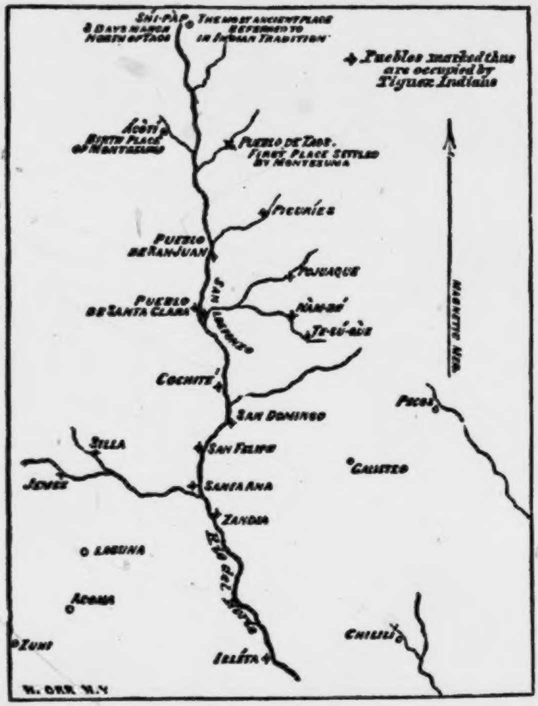
VI. The sixth district is situated upon the southern borders of the pueblo territory and embraces the cavate houses among the potreros west of the Rio Grande, also the ancient ruins of the deserted villages and ancient Spanish settlements along the northern borders of Texas.

VII. There is one other district not represented on the map which is situated in Sonora, Mexico, and contains the ancient ruins of the Casas Grandes described by Mr. Bartlett and others.

## INDIAN MAP OF THE RIO GRANDE.

The following map is the one which was secured by Major Whipple from an Indian. It represents the inhabited pueblos on the Rio Grande, which have been described by Mr. Bandelier as follows:

"Acoma is a regular three-storied village since every one of its long buildings contains three floors, of which only the upper two are inhabited; but Isleta has lost the pueblo character completely. As to the plan of the villages it varies according to topography and surroundings. San Ildefonso forms a hollow qradrilateral; Jemez, Santa Clara and San Felipe are each a double quadrangle with two squares; Santa Domingo, San Juan, Santa Ana and Acoma, consist of several parallel rows of houses, and have from one to three streets. Zuni is one gigantic building very irregularly disposed, traversed by alleys called streets, and interspersed with several interior squares. Taos has two tall houses facing each other, one on each side of a little stream and communicating across it by means of a wooden foot-bridge. The same is the plan of the houses of Pecos. The material of which the houses are constructed varies—Acoma is of stone and rubble; Isleta, San Domingo and Cochiti are of adobe. Very often one of the same pueblo will display both kinds of material. There are still occasional traces of the ancient custom by which the women were required to rear and plaster the walls, while the men were to attend to the wood-work, the cutting of the beams and poles."


SHI-PAP
8 DAYS MARCH NORTH OF TAOS
THE MOST ANCIENT PLACE REFERRED TO IN INDIAN TRADITION
Pueblos marked thus are occupied by Tiguex Indians
ACOTI
BIRTH PLACE OF MONTEZUMA
PUEBLO DE TAOS.
FIRST PLACE SETTLED BY MONTEZUMA
PICURIES
PUEBLO DE SAN JUAN
POJUAQUE
PUEBLO DE SANTA CLARA
SAN ILDEFONSO
NAMBE
TE-SU-QUE
MAGNETIC MER.
COCHITE
SAN DOMINGO
PECOS
SILLA
SAN FELIPE
JEMEZ
SANTA ANA
GALISTEO
ZANDIA
LAGUNA
Rio del Norte
ACOMA
ZUNI
CHILILI
ISLETA

# CHAPTER VI.

## HIGH HOUSES AND RUINED TOWERS.

The discovery of the Cliff-dwellings was a startling event. It occurred in 1874, in connection with the work of Hayden's Geological Survey, An account of it was published in the Annual Report of 1875-6, and excited at the time very general interest. No archæological discovery has ever awakened more attention and excited more curiosity than this. Many ruined dwellings had, indeed, been discovered by the various parties that had traversed the Great Plateau, and descriptions of them had been published, but they were ordinary pueblos, with which the public had become somewhat familiar, while these presented a style of aboriginal dwellings which was not known to exist elsewhere. The first consisted of a large number of apartments and constituted a village, while these were solitary and isolated dwellings, suitable only for the home of a single family. The pueblos were situated in the valleys of the streams or upon the mesas, and access to them was comparatively easy, but cliff-dwellings were in the sides of the cliffs, and at such marvelous heights as to be almost inaccessible. The pueblos were generally in plain sight, and along the ordinary familiar routes, while these were in a remote district, amid wild and lonely cañons, and so hidden as to escape common observation. The pueblos were inhabited, and the people gave the discoverers a welcome, but the cliff-dwellings were lonely and uninhabited. No one knew the history of those who had dwelt in them, or could tell the fate of those who had left them.

It is not then strange that great interest was awakened, and much speculation and startling theories were advanced concerning them. We may say, however, that the interest has not ceased, nor has the mystery which enveloped this subject entirely disappeared. Though scientific students have entered into the midst of them, and studied the details of their structure, and so accumulated facts, that our knowledge has become more accurate and speculation less fanciful; yet the history of the people is wanting, and there is no reliable tradition concerning them.

It is not our purpose to furnish a history of the Cliff-dwellers, nor to advance any theory concerning their age or final destiny, but we shall take up the narrative which was given by the discoverers, and examine the facts brought out by them, and endeavor, if possible, to define the character of the culture, and describe the life of the people.

I. Let us consider the geographical locality in which the cliff-dwellings were situated. On this we shall find much aid from the study of the map as well as the narrative.

We notice that the pueblos and a certain class of cave-dwellings are scattered all over the region embraced in the bounds of the four great states of New Mexico, Colorado, Arizona and Utah; but there is a district lying close about the meeting place of the four states in which not only the pre-historic ruins of the plateaus and the valleys are found, but also many cliff-dwellings built into the dizzy recesses of the cañon walls, imposing in their position and structure. Probably there is no other district in this once widely-inhabited region richer in these high cliff-dwellings than this Great Plateau, 30 miles long and 15 wide, called the "Mesa Verde."

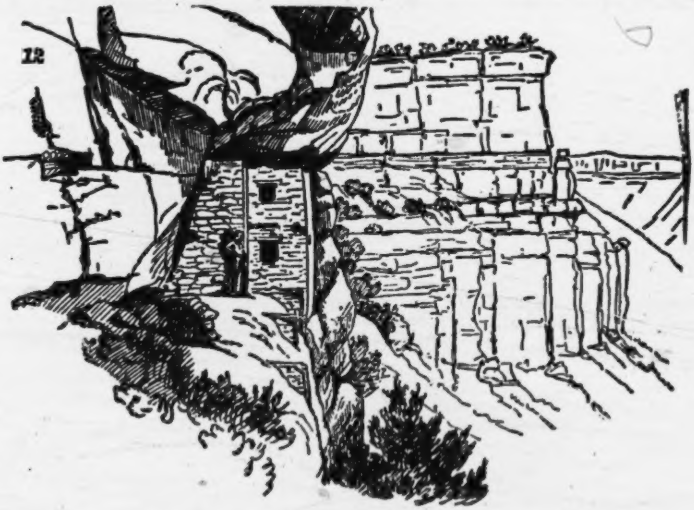


Fig. 1. THE FIRST HIGH CLIFF-HOUSE DISCOVERED.

This great timbered plateau rises in rough, forbidding cliffs from 1,500 or 2,000 feet above the valley of the stream which passes through it, making a series of deep cañons which are distinguished for their remarkable scenery, isolation, and wildness. In the walls of these arid cañons and in the midst of the high mountains the Cliff-men built some of their most elaborate and imposing fortresses, but wrung a meagre subsistence from the valleys below, fighting, meanwhile, for even this scanty foothold in the wilderness against the attack of a lurking, but a constantly-increasing savage foe.

It will be seen from the following descriptions that this is one of the most singular regions of the entire country. It forms an isolated area, which was filled with an extensive population in pre-historic times, and was undoubtedly connected with the other areas to the south-east and south-west. It was, apparently, a most secure retreat from the attacks of the wild tribes which were constantly hovering about the edges of the Great Plateau region, and were frequently besieging the Pueblos in their homes. It was, however, a mountainous region, apparently destitute of resources for subsistence, and might be regarded as a poor place for permanent occupation. The question arises: "What kind of a life did the Cliff-dwellers lead in this region? how did they secure a subsistence for themselves and their families?" On this point there have been various theories, for some have maintained that they were wild hunters, others that they were agriculturists. We maintain, however, that they were mountaineers, and in proof would call attention to the following extracts: Mr. W. H. Holmes says:

> The Rio San Juan drains a great basin, covering over 20,000 square miles, as well as several great mountain masses bordering it. The tributaries to it head in the southern face of the Sierra Abajo, which is one of the highest peaks.
>
> The view from its summit is one of more than ordinary interest; to the east the view is interrupted only by the La Plata and San Juan mountains, 100 miles away; in the south are the Sierra Carisso; in the west are the Henry Mountains; to the north, the Sierra La Sal, all in plain view, yet outlining a circle, and including an area of 20,000 square miles. To the south lies the broad valley of the Rio San Juan, the delicate thread which lines its bank being barely visible through the notches cut by the deep side cañons. Beneath us, on the west, is the Rio Colorado, though its course is scarcely traceable through the labyrinth of cliffs and cañons. Beyond the San Juan, to the south-west, the wonderful forms of Monumental Valley can be seen. Beyond this the outlines of a broad table-land, which extends toward the Rio de Chelley and south-west toward the Moqui country. The drainage of this valley on the north connects it with the Rio Dolores, the divide between them being somewhat narrow, and the head waters interlocking through the Great Plateau, separate these streams and the different branches of the San Juan The table-lands intervene between the streams, on the west, such as Montezuma, the Hovenweep, the McElmo and the Epsom Creek, obtaining a very nearly uniform height of 500 feet, running up to nearly 1.000 feet as we approach the Dolores divide. The San Maguel Mountains lie in the extreme north-east corner, and constitute the divide between the waters of the Animas and Dolores on the south, and Rio San Maguel on the north. This divide reaches an altitude of 11,500 feet. A conical peak, called Lone Cone, is a very prominent landmark.*

Mr. W. H. Jackson describes the same region in the following words:

> The "Mesa Verde" extends north and south about 20 miles, and east and west about 40 miles. It is of a grayish-yellow cretaceous sandstone, with a very nearly horizontal bedding, so that the escarpment is about equal on all sides, ranging from 600 to 700 feet in height. The side cañyons penetrate the mesa and ramify it in every direction, always presenting a perpendicular face, so that it is only at very rare intervals the top can be reached. But once up there we find excellent grazing and thick groves of cedar and pinôn pine. From the bottom of the cañon up, the slopes of the escarpments are thickly covered with groves of cedar, gnarled and dwarfed. Below, the cottonwood and willow grow luxuriantly beside the

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* The map shows ruins and the streams upon which they are located, but faintly represents the mountainous character of the country.

streams, while dense growths of a reedy grass tower above our heads as we ride through it. Throughout its entire length the cañon presents an average width of about 200 yards.

### Mr. F. H. Chapin, the great mountain climber, says:

It is in that section of Colorado which is embraced by the "Mesa Verde" that the grandest, as well as the most picturesquely situated ruins have been discovered. This in connection with the fact that this land of cañons and mesas is surrounded on the north and east by one of the most beautiful mountain chains in the world, renders the country the most fascinating field for the explorer.

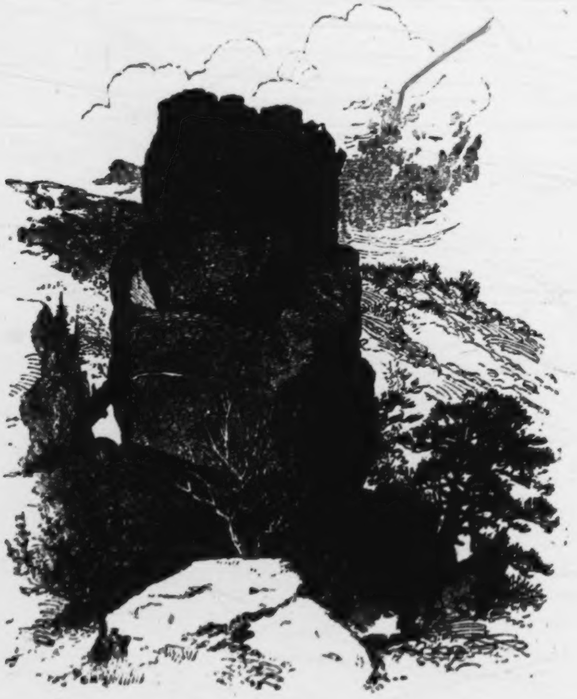

FIG. 2. BLACK TOWER ON THE MANCOS

### Mr. W. H. Jackson says:

All that portion of the country lying between the "Mesa Verde" and the Sierra Abajo, covers an aggregate of some 2,500 square miles. Their labyrinthian cañons head close to the Dolores on the north, and ramify the plateau in every direction with deep and desolate gorges and wide and barren valleys. There is not a living stream throughout this whole region. Between the Montezumas and the Hovenweep is a high plateau, running north and south from the San Juan to the Dolores. Upon this we found the remains of many circular towers, these generally occupying slight eminences.

This mesa, or plateau, averages about 500 feet in height above the surrounding country, but does not contain a spring or a drop of water, except such as may remain in holes in the rocks after a shower. As cultivation was out of the question, it is very likely that these towers were look-outs, or places of refuge for the shepherds, who brought their sheep here to graze.

As a great portion of this region is a bare bed of rocks, with the soil in the lowlands, nearly impervious to moisture, the winter's showers soon gather together their waters in great floods in the main channels, and form the deep "washes" so characteristic of the country. In some valleys, where the drainage is considerable, these "washes" attain a depth of from thirty to forty feet, and are impassable for many miles.

Mr. Jackson further says in reference to this region:

> The bottoms are from three to five miles in width, and bordering the stream, covered with dense growths of cottonwood and willows. The broad and fertile alluvial lands, well covered with grass, and the low sage bush benches bordering them, will, undoubtedly, prove a rich agricultural possession at no distant day.*

Mr. W. H. Holmes also says:

> The district examined by our party covers an area of nearly 6,000 square miles, chiefly in Colorado, but which include narrow belts in the adjacent territories of New Mexico, Utah and Arizona. It lies wholly on the Pacific slope, and belongs almost entirely to the drainage system of the Rio San Juan, a tributary of the Colorado of the West. . . . . . In the greater part of this region there is little moisture apart from these streams, and, as a consequence, vegetation is very sparse, and the general aspect of the country is that of a semi-desert. Yet there is bountiful evidence that at one time it supported a numerous population; there is scarcely a square mile in the 6,000 examined that does not furnish evidence of previous occupation by a race totally distinct from the nomadic savages who hold it now, and, in many ways superior to them. . . . . . I observe the fact that the great bulk of remains are on. or in, the immediate neighborhood of running streams, or by springs that furnish a plentiful supply of water during the greater part of the year. . . . . . I also notice that the country is by no means an entire desert. All along the stream-courses there are grass-covered meadows and broad belts of alluvial bottom, affording, if properly utilized, a considerable area of rich tillable land.

Such is the description of the region in which the Cliff-dwellings, as such, were found, a description which shows that the region was well chosen as the retreat of a people who seem to have been fugitives from the attacks of savage tribes, and who made these mountain fastnesses their abode at some period in the distant past, the date of which is now unknown.

We are impressed by the thought that the Cliff-dwellers were hardy mountaineers, but, like other mountaineers, were accustomed to draw their subsistence from the valleys. Doubtless, there was a strong influence in the scenery and surroundings, which made it easy for them to have followed this double kind of life, and make their homes so high in the sides of the cliffs, and yet carry on their toils at so great a distance.

They are not, however, the only people who have had their fields at a distance from their homes, for it is well known that the Pueblos are, even to this day, accustomed to form camps at a distance from their villages, and spend the summer in cultivating the fields, and carrying back their produce to the villages when gathered.

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* See Hayden's Report for 1876; page 412.

One would suppose from the character of these mountain fastnesses that the people would be the last to be driven out, yet as we read the descriptions of the pueblos on the Cañon de Chaco, and especially the description of the cliff-dwellings in the "Mesa Verde," we find them all abandoned, the entire region left desolate, with only a few wandering tribes occupying the river valleys, placing their rude tents amid the ruins of the elaborate stone houses and towers and temples of the preceding people.*

II. We turn next to the discovery of the Cliff-dwellings, or the so-called "High Houses," and the different classes of structures which were associated with them. We find that while the high houses were the most interesting, yet there were many ruined towers situated in the valley, and clusters of ruined pueblos in various directions, all of which need to be studied in order to make up our minds as to the culture of the Cliff-dwellers. Let us then, take these in their order of discovery. The following is a description given by Mr. W. H. Jackson:

> In the extreme south-west corner of Colorado are groups of old ruined houses and towns, displaying a civilization and intelligence far beyond that of the present inhabitants. Commencing our observation in the park-like valley of the Mancos, between the Mesa and the mountains, we find that the low benches that border the stream upon either side bear faint vestiges of having, at some far-away time, been covered with dwellings, grouped in communities, apparently, but now so indistinct as to present to the eye little more than unintelligible mounds. By a little careful investigation, however, the foundations of great square blocks, of single buildings and of circular inclosures can be made out; the latter, generally, with a depressed center, showing an excavation for some purpose.
>
> Entering the cañon at its upper end we strike into the old Indian trail, which comes over from the head of the Rio Dolores; and passing down this cañon a short distance, turns off to the left, and goes over to the La Plata.
>
> Grouped along in clusters and singly were indications of former habitations, very nearly obliterated, and consisting mostly, in the first four or five miles, of the same mound-like forms noticed above, and accompanied always by the scattered, broken pottery.
>
> As we progressed down the cañon the same general characteristics held good, the great majority of the ruins consisting of heaps of *debris*, a central mass considerably higher and more massive than the surrounding lines of subdivided squares.
>
> We now commenced to note another peculiar feature. Upon our right, the long slopes of protruding strata and *debris* formed promontories, extending out into the cañon. Upon these, and not more than 50 feet above the stream, we found frequent indications of their having been occupied by some sort of works, the foundations of which, in every case, were circular, with a deep depression in the center, and generally occurring in pairs,

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* The home of the Cliff-dwellers may be divided into four distinct localities, in each of which the ruins were discovered at different times and by different explorers. The division is as follows:

1st. On the rivers which flow from the south to the north, including De Chaco, Amarillo, De Largo, apparently form the home of a people who dwelt in pueblos of the regular terraced class, descriptions of which have been given by Gen. Simpson, Newberry and others, from 1830 to 1851.

2nd. The rivers which flow from the north to the south, including the La Plata, Animas and San Juan, seem to have been the abode of a people who dwelt mainly in caves or cavate houses, descriptions of which have been given by W H. Holmes in his report, while in connection with the Hayden survey, in 1875 and 1878.

3rd. The region which is drained by the Mancos, Navajo Canon, and which is called the "Mesa Verde," is the locality where high cliff-dwellings are the most numerous, these have been described by W. H. Jackson, W. H. Holmes, and F. H. Chapin, in 1881; Dr. Beardsall, in 1887; and Baron Nordenksjold, in 1892, some of which we have designated High Cliff Dwellings.

two side by side, ranging from 10 to 20 feet in diameter. There was no masonry of any kind visible, but, thickly strewn all about, any quantity of broken pottery. Above were indications of habitations in the face of the cliff, but not marked enough to warrant further search. At those places where the trail ran high up, near the more precipitous portion of the bluff, we found remnants of stone walls, inclosing spaces of from five to twelve feet in length in the cave-like crevices, running along the seams. Nothing of any greater importance was found up to the time we made camp at nightfall.

Our camp for the night was among the stunted piñons and cedars immediately at the foot of the escarpment of the "mesa," its steep slopes and perpendicular faces rising nearly 1,000 feet above us.

### Now comes the discovery of the first "High House:" See. fig 1.

Just as the sun was sinking behind the western walls of the cañon, one of the party descried, far up the cliff, what appeared to be a house with a square wall and apertures, indicating two stories, but so far up that only the very sharpest eyes could define anything satisfactorily. We had no field-glass with the party, and to this fact is probably due the reason we had not seen others during the day in this same line, for there is no doubt that ruins exist throughout the entire length of the cañon, far above and out of the way of ordinary observation.

The discovery of this one, so far above anything heretofore seen, inspired us immediately with the ambition to scale the height and explore it, although night was drawing on fast, and darkness would probably overtake us among the precipices, with a chance of being detained there till night. All hands started up, but only two persevered to the end. The first 500 feet of ascent were over a long, steep slope of *debris* overgrown with cedar; then came alternate perpendiculars and slopes. Immediately below the house was a nearly perpendicular ascent of 100 feet that puzzled us for a while, and which we were only able to surmount by finding cracks and crevices into which fingers and toes could be inserted. From the little ledges occasionally found, and by stepping on each other's shoulders, and grasping tufts of *yucca*, one would draw himself up to another shelf, and then, by letting down a stick of cedar, or a hand, would assist the other. Soon we reached a slope, smooth and steep, in which there had been cut a series of undulating hummocks, by which it was easy to ascend, and without them, almost an impossibility.

The house stood upon a narrow ledge, which formed the floor, and was overhung by the rocks of the cliff. The depth of this ledge was about 10 by 20 feet in length, and the vertical space between the ledge and overhanging rock some 15 feet. The house occupied the left-hand half as we faced it; the rest being reserved as a sort of esplanade, a small portion of the wall remaining, which cut it off from the narrow ledge running beyond. The edges of the ledge upon which the house stood were rounded off, so that the outside wall was built upon an incline of about 45 degrees. The house itself, perched up in a little crevice like a swallow's nest, consisted of two stories, the total height being about 12 feet, leaving a space of two or three feet between the top of the walls and the overhanging rock.[*] The ground plan showed a front room, about 6x9 feet in dimensions, back of it two smaller rooms, the face of the rock forming their back walls. They were each about five or seven feet square, and in the lower front room are

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4th. The region which lies to the westward of the Mesa Verde, and which is drained by the Montezuma and the McElmo, the Hovenweep on the north, the Rio de Chelly on the south, is distinguished for the large number of remarkable ruins, some of which have been described by Gen. Simpson, Dr. W. H. Hoffman, W. H. Jackson and W. H. Holmes, and which constitute a series which is as varied in its character as those to the east of the Mesa Verde, but in which there are some remarkable specimens of High Cliff Dwellings, or what might be called cave villages, or cliff towns.

5th. A region situated at the head waters of the Verde River, contains a number of cliff-dwellings, which resemble those on the Mancos Canon. One of these was discovered by Mr. W. H. Hoffman, in 1874, at a place called Montezuma Wells; another was discovered by Dr. J. W. Fewkes, in 1896, at a place called Red Rocks. [See American Anthropologist, August, 1896; page 265.]

[*] This house is described on pages 126 and 127.

two apertures, one serving as a door and opening out upon the esplanade, about 20x30 inches in size, the lower sill 24 inches from the floor, and the other a small outlook, about 12 inches square, up near the ceiling, and looking over the cañon beneath. In the upper story a window, corresponding in size, shape and position to the door below, commands an extended view down the cañon. Directly opposite this window is a similar one, opening into a large reservoir, or cistern, the upper walls of which come nearly to the top of the window. The entire construction of this little human eyrie displays wonderful perseverance, ingenuity and some taste. Perpendiculars were well regarded, and the angles carefully squared. The stones of the outer rooms, or front, were all squared and smoothly faced, but were not laid in regular courses, as they are not uniform in size, ranging from fifteen inches in length and eight inches in thickness down to very small ones.

About the corners and the windows considerable care and judgment were evident in the over-lapping of the joints, so that all was held firmly together. The only sign of weakness is in the bulging outward of the front wall, produced by the giving way, or removal, of the floor beams. The back portion is built of rough stone, firmly cemented together.

Most peculiar, however, is the dressing of the walls of the upper and lower front rooms, both being plastered with a thin layer of firm adobe cement, of about an eighth of an inch in thickness, and colored a deep maroon red, with a dingy white band, eight inches in breadth, running around the floor, sides and ceiling. In some places it has peeled away, exposing a smoothly-dressed surface of rock.

Ruins of half a dozen lesser houses were found near by, but all in such exposed situations as to be quite dilapidated. Some had been crushed by the overhanging wall falling upon them, and others had lost their foothold and tumbled down the precipice. One little house in particular, at the extremity of this ledge, about fifty rods below the one described above, was especially unique in the daring of its site, filling the mind with amazement at the temerity of the builders, and the extremity to which they must have been pushed.

Mounting our own animals we pushed on down the cañon, which now opened out into quite a valley, side cañons opening in from either hand, adding much to the space. Every quarter of a mile, at the most, we came upon evidences of former habitations, similar to those already described. Two or three miles below the house in Fig. 1, we discovered a wall standing in the thick brush upon the opposite side of the river.

The walls discovered were a portion of an old tower. See fig. 1, and 2, in plate.

In the midst of a group of more dimly-marked ruins or foundations, extending some distance in each direction from it. As seen in the figure referred to, the tower consists of two lines of walls, the space between them divided into apartments, with a single circular room in the center. The outside diameter of all is 25 feet, that of the inner circle 12 feet, and as the walls were respectively 18 and 12 inches in thickness, left a space of four feet for the small rooms. This outer circle was evidently divided into six equal apartments, but only the divisions marked in the diagram could be distinguished.

Half a mile below, in the vertical face of the rock, and at a height of from 50 to 100 feet from the trail, were a number of little, nest-like habitations.[1] Communications with the outside world was from above to a small window-like door, not shown in the sketch. Two small apertures furnish a look-out over the valley.

Near by, upon a low ledge, and readily accessible from below, is a string of five or six houses, evidently communicating,—mere kennels compared with some others—made by walling up the deep cave-like crevices in the sandstone. The same hands built them that lived in the better houses; the masonry being very similar, especially the inside chinking, which was perfect, and gave the walls a very neat appearance.[2]

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[1] Fig. 5 plate illustrates one of them and their general character.

[2] Mr. E. A. Barber says that there was a tower just below the first "High House. (See Am. Naturalist, Aug., 1878.)

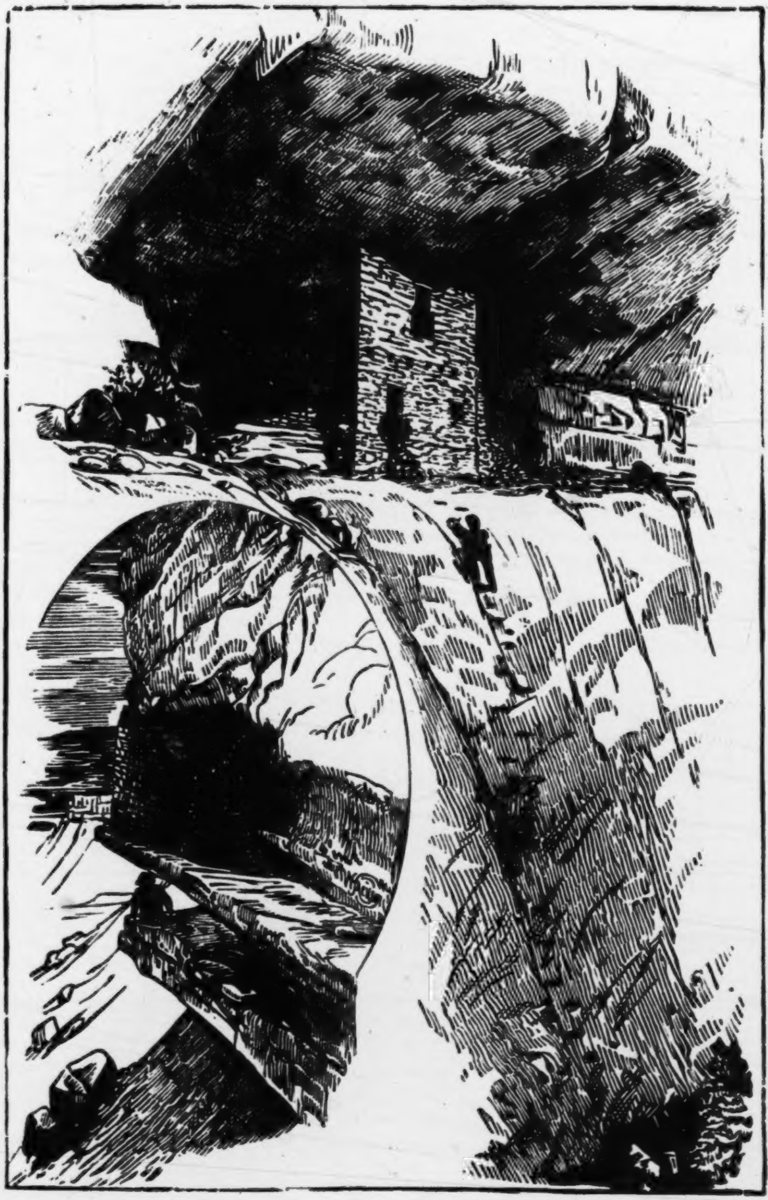


FIG. 3. SOLITARY HOUSE ON McELMO CANON.

Plate III.

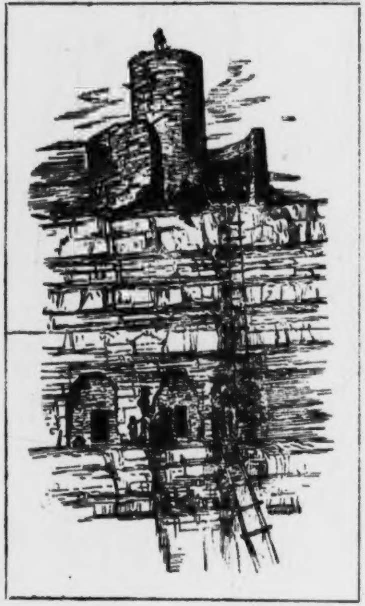


Plate II

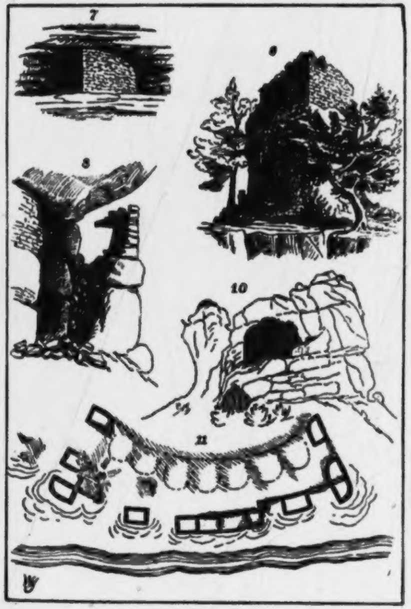
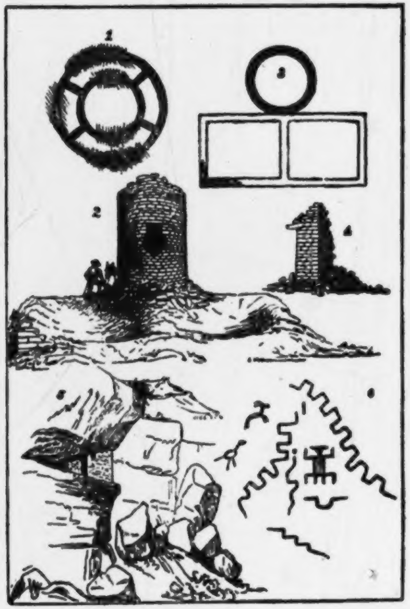


Plate I.



RUINED TOWERS ON THE La PLATA, MANCOS AND Mc ELMO. W. H. HOLMES.

Two or three miles further and the cañon changes in feature again, the highest level of the *mesa* coming forward, and towering over the valley with a thousand feet of altitude, the bottom lands widening out to a half and three-quarters of a mile in breadth.

Referring toFig. 1, the position of these houses can be seen in the dark heavy lines near the summit, just above the most precipitous portion of the bluff, generally at a height of from 600 to 800 feet above the level of the cañon.

## The second discovery: (see plate fig. 7.)

In the high bluff, on the right hand in the sketch, are some of the most curious and unique little habitations yet seen. While jogging along under this bluff, fully 1,000 feet in height, and admiring its bold outlines and brilliant coloring, one of our party, sharper-eyed than the rest, descried, away up near the top, perfect little houses, sandwiched in among the crevices of the horizontal strata of the rock of which the bluff was composed. Two of the party started up to scale the height and inspect this lofty abode. By penetrating a side cañon some little ways, a gradual slope was found that carried them to the summit of the bluff. Now, the trouble was to get *down* to the houses. This was accomplished only by crawling along a ledge of about 20 inches in width, and not tall enough for more than a creeping position. In momentary peril of life — for the least mistake would precipitate him down the whole of this dizzy height — our adventurous seeker after knowledge crept along the ledge until the broader platform was reached, upon which the most perfect of the houses alluded to stands. The ledge ended with the house, which is built out flush with its outer edges. This structure resembles in general features the cliff-houses already spoken of. The masonry is as firm and solid as when first constructed, the inside being finished with exceptional care. In width it is about five feet in front, the side wall running back in a semi-circular sweep; in length fifteen, and in height seven feet. The only aperture was both door and window, about 20x30 inches in diameter. In its uniqueness consisting in its position on the face of the bluff, to the casual observer this building it would not be noticed once in fifty times in passing, so similar to the rocks between which it is plastered does it appear from our position on the trail. A short distance to the right, and on the ledge above, is another building of somewhat ruder construction, but with corners square and the walls truncated.

## The towers and observatories which were found in the vicinity of these remarkable cliff-dwellings are next described:

Proceeding down the broad, open cañon over the now very easy trail, we espied upon the opposite side of the stream a tower of apparently greater dimensions than the ones noticed above. The tower only remained; this is circular, 12 feet in diameter, and now about 20 inches in height, the wall being about 16 inches in thickness. Facing the valley northward is a window-like aperture, about 18x24 inches in size, the lower lintel some seven or eight feet above the base. Fig. 2 in plate.

A short distance above our camp, and upon the top of the *mesa*, which, at this point, is not more than 125 feet above the valley, we found a tower very similar to that on the Mancos—(see Fig. 5)—but considerably larger, and surrounded by a much greater settlement. It is about 50 feet in diameter, and, like the Mancos one, double-walled, the space between the two about six feet in width, and sub-divided into small apartments by cross-walls, pierced with communicating doors or windows. Immediately surrounding this tower is a great mass, of which it is the center, of scattered heaps of stone *debris*, arranged in rectangular order, each little square with a depressed center, suggesting large sub-divided buildings, similar to the great community-dwellings of the Pueblos and Moquis and the old ruins of the Chaco. Upon the south-east corner of this group, and upon the very edge of the *mesa*, are the remains of another smaller tower, and below it, founded upon the bottom of a small cañon, which run up at right angles to the McElmo, is a portion of a heavy wall. This group covers a space of about 100 square yards, while adjoining it, on the *mesa*, is group after group on the same plan,—a great central tower and smaller surrounding buildings. They cover the whole breadth and length of the land. Half a dozen miles down, and we came upon several little nest-like dwellings, very similar to those in Figs. 5 and 7, but only about 40 or 50 feet above the valley. Two miles farther, and we came upon the tower shown in Plate Fig. 9, upon the summit of a great square block of sandstone, some forty feet in height, detached from the bluff back of it. The building, upon its summit, is square, with apertures like windows upon two faces, looking east and north, and very much ruined, but still standing in some places about 15 feet above the rock on which it is built. At the base of the rock is a wall running about it, a small portion only remaining, the rest thrown down and covered with *debris* from the house above.

While passing the mouth of a wide side cañon, coming in from the right, a tall, black-looking tower caught our eyes, perched upon the very brink of the *mesa*, overlooking the valley.—(See fig. 2, on p. 84.)

A huge block of sandstone has rolled down from the escarpment of the *mesa* above, lodging upon the very brink of a bench midway between top and bottom, and upon this the tower is built, so that from below both appear as one. They are of the same diameter, about 10 feet, and some 18 feet in height, equally divided between rock and tower. In construction, it is similar to those already described, of single wall. It was evidently an outpost, or watch-tower, guarding the approach to a large settlement upon or beyond the *mesa* lying above it.*

The solitary house discovered by Mr. Jackson, (see fig. 3.) on the Canon De Chelley should be mentioned in this connection. He says:

Its construction is very similar to that of the house shown in fig. 1, but it is over-hung by a less height of the impending bluff. It was reached by a series of steps cut into the rock.

The house 20 feet in height, consists of two stories built against the sloping wall of the bluff. The lower story is 10x18 feet square, divided into two rooms, with a door communicating between the two, and a large door opening outward. The upper floor appears to have been in one room with one large window facing outward. Extensions erected upon either side and also a kind of structure in front, resembling a balcony covering the lower door-way. About twenty rods away at the foot of the bluff, there is a deep natural reservoir or basin, about thirty feet in diameter and the same in depth, that seems to have retained a perpetual supply of water.

The most remarkable specimen of a high-cliff house is the one discovered by Mr. W. H. Holmes, and described as follows:

The group given in this plate is of a very interesting and remarkable character. It was first observed from the trail far below, and fully one-fourth of a mile away. From this point, by the aid of a field-glass, the sketch given in the plate was made. So cleverly are the houses hidden away in the dark recesses, and so very like the surrounding cliffs in color, that I had almost completed the sketch of the upper houses before the lower, or "sixteen-windowed" one was detected. (see fig. 4.)

They are, at least, eight hundred feet above the river. The lower five hundred feet is of rough cliff-broken slope, the remainder, of massive bedded sandstone, full of wind-worn niches, crevices and caves. Within one hundred feet of the cliff top, set deep in a great niche, with arched, overhanging roof, is the upper house, its front wall built along the very brink of a sheer precipice. Thirty feet below in a similar, but less remarkable niche, is the larger house, with its long line of apertures, which I afterward found to be openings intended rather for the insertion of beams than for windows.

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* See U. S. Geological and Geographical Survey of Colorado and Adjacent Vicinity, 1874. Quotations from "Ancient Ruins in South-Western Colorado," by W. H. Jackson.

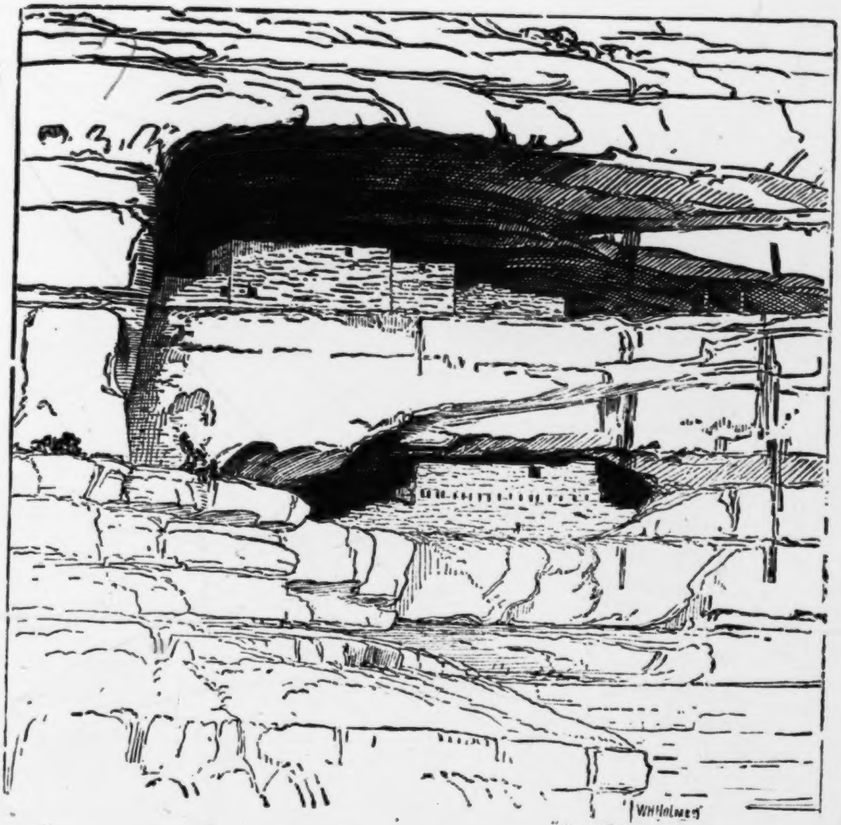
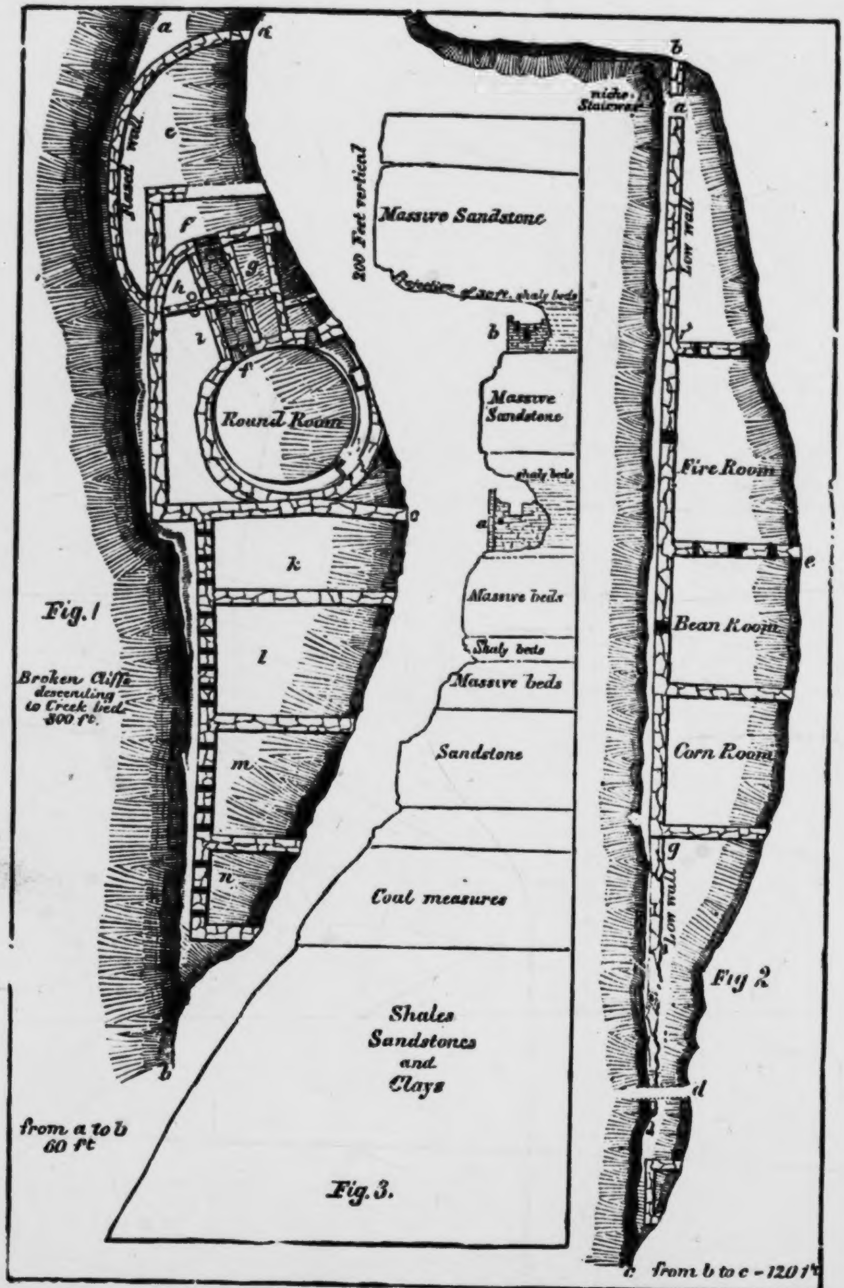


FIG. 4. SIXTEEN WINDOWED HIGH HOUSE--W. H. HOLMES.

This High House reminds us of the Cliff-Dwellings discovered by Nordenskjold in 1892, though the arrangement of the buildings on two separate ledges differs from any found elsewhere. Nordenskjold has described certain houses as furnished with balconies projecting in front of the house. He has spoken of others as having port-holes or openings in the walls through which arrows were shot, and quotes from Castaneda a description of port-holes built diagonally through the walls of the pueblos. The narrow passage which Holmes described as designed for entrance into the "Estufa," Nordenskjold thinks was designed for ventilation and speaks of this as characteristic of the Estufas of the cliff-dwellers.


a
n
c
Road wall
f
g
h
i
f
Round Room
o
k
l
m
n
Fig. 1
Broken Cliffs descending to Creek bed 800 ft.
b
from a to b 60 ft
200 Feet vertical
Massive Sandstone
Projection of soft. shaly beds
b
Massive Sandstone
shaly beds
a
Massive beds
Shaly beds
Massive beds
Sandstone
Coal measures
Shales Sandstones and Clays
Fig. 3.
b
niche
Stairway
a
Low wall
f
Fire Room
e
Bean Room
Corn Room
g
Low wall
Fig 2
d
c
from b to c - 120 ft

SECTION AND GROUND PLAN OF THE HIGH HOUSES.

The lower house was easily accessible, and proved to be of a very interesting character. It occupies the entire floor of a niche. which is about sixty feet long and fifteen feet in depth at the deepest part. The front walls are built flush with the precipice. and the partition walls extend back to the irregular wall of rock behind. Portions of the wall at the left, viewing the house from the front, are greatly reduced ; but the main wall, that part which contains the window-like openings, is still thirteen or fourteen feet high. The arrangement of the apartments is quite complicated and curious, and will be more readily understood by reference to the ground plan—(Fig. 1.) The precipice-line, or front edge of the niche floor, extends from *a* to *b*. From this the broken cliffs and slopes reach down to the trail and river, as shown in the accompanying profile—(Fig. 3.) The line *b*, *c*, *d* represents the deepest part of the recess, against which the walls are built. To the right of *b* the shelf ceases, and the vertical face of rock is unbroken. At the left, beyond *a*, the edge is not so abrupt, and the cliffs below are so broken that one can ascend with ease. Above, the roof comes forward and curves upward, as seen in the profile.

The most striking feature of this structure is the *round-room*, which occurs about the middle of the ruin, and inside of a large rectangular apartment. The occurrence of this circular chamber in this place is highly significant, and tends greatly to confirm my previously-stated opinion, that the circle had a high significance with these people. Their superstitions seem to have been so exacting in this matter that even when driven to the extremity of building and dwelling in the midst of these desolate cliffs, an inclosure of this form could not be dispensed with ; a circular estufa had to be construcfed at whatever cost of labor and inconvenience.

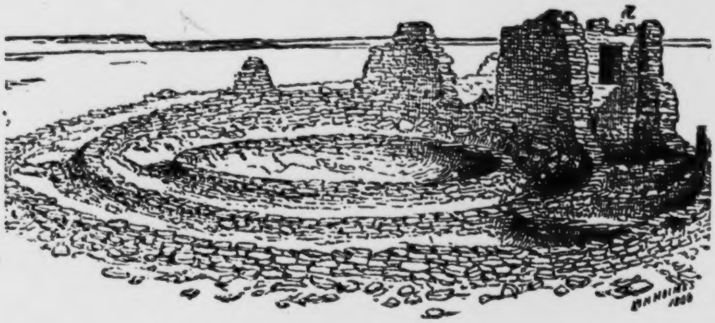


FIG. 5 RUINED TOWER ON THE MANCOS.

Its walls are not high and not entirely regular, and the inside is curiously fashioned with offsets and box-like projections. It is plastered smoothly, and bears considerable evidence of having been used, although I observed no traces of fire. The entrance to this chamber is rather extraordinary, and further attests the peculiar importance attached to it by the builders, and their evident desire to secure it from all possibility of intrusion. A walled and covered passage-way, *f f*, of solid masonry, ten feet of which is still intact, leads from an outer chamber. through the small intervening apartmsnts, into the circular one. It is possible that this originally extended to the outer wall, and was entered from the outside. If so, the person desiring to visit the estufa would have to enter an aperture about twenty-two inches high by thirty wide, and crawl, in the most abject manner possible, through a tube-like passage-way nearly twenty feet in length.

My first impression was that this peculiarly-constructed door-way was a precaution against enemies, and that it was, probably, the only means of entrance to the interior of the house, but I am now inclined to think this hardly probable, and conclude that it was rather designed to render a sacred chamber as free as possible from profane intrusion. The apartments, *l, k, m, n*, do not require any especial description, as they are quite plain and almost empty. The partition walls have never been built up to the ceiling of the niche, and the inmates, in passing from one apartment to another, have climbed over. The row of apertures indicated in the main front wall are about five feet from the floor, and were doubtless intended for the insertion of beams, although there is no evidence that a second floor has at any time existed.

In that part of the ruin about the covered passage-way the walls are complicated, and the plan can hardly be made out, while the curved wall enclosing the apartment is totatally overthrown. . . . . . . . The rock-face between this ruin and the one above is smooth and vertical, but by passing along the ledge a few yards to the left a sloping place was found, up which a stairway of small niches had been cut; by means of these an active person, unencumbered, can ascend with safety. On reaching the top, one finds himself in the very door-way of the upper house — (*a*, Fig. 2) — without standing-room outside of the wall, and one can imagine that an enemy would stand but little chance of reaching and entering such a fortress, if defended even by women and children alone. The position of this ruin is one of unparalleled security, both from enemies and from the elements. The almost vertical cliff descends abruptly from the front wall, and the immense arched roof of solid stone projects forward fifteen or twenty feet beyond the house. (See Section, Fig. 3.) At the right the ledge ceases, and at the left stops short against a massive vertical wall. The niche stairway affords the only means of approach.

The house occupies the entire floor of the niche, which is about one hundred and twenty feet long by ten in depth at the deepest part. The front wall to the right and left of the doorway is quite low, portions having doubtless fallen off. The higher wall, *f g*, is about thirty feet long and from ten to twelve feet high, while a very low rude wall extends along the more inaccessible part of the ledge, and terminates at the extreme right in a small enclosure, as seen in the plan at *c*.

In the first apartment entered there were evidences of fire, the walls and ceiling being blackened with smoke. In the second, a member of the party, by digging in the rubbish, obtained a quantity of beans, and in the third, a number of grains of corn, hence the names given. There are two small windows in the front wall, and the doorways communicate between rooms separated by high partitions.

Figure 3 is given for the purpose of making clear the geologic conditions that give shape to the cliffs, as well as to show the relations of these houses to cliffs. The hard and massive beds of rock resist the erosive agents, the soft and friable beds yield, hence the irregularity. The overhanging cliffs, the niches, the benches, *a*, is a section of the lower house, *b*, of the upper.

It has heretofore been supposed that the occupants of these houses obtained water either from the river below or from springs on the mesa above; but the immense labor of carrying water up these cliffs, as well as the impossibility of securing a supply in case of a siege, made me suspect the existence of springs in the cliffs themselves. In three or four cases these springs have been found, and it is evident that with a climate a very little more moist than the present, a plentiful supply could be expected. Running water was found within a few yards of the group of houses just described, and Mr. Brandegee observed water dripping down the cliffs near a group of small houses on the opposite side of the cañon.

Mr. Holmes also discovered various towers which were associated with ruined dwellings. He says:

The ruin, of which a plan is given, occurs on the left bank of the Mancos, about eight miles above the foot of the cañon. It is one of the

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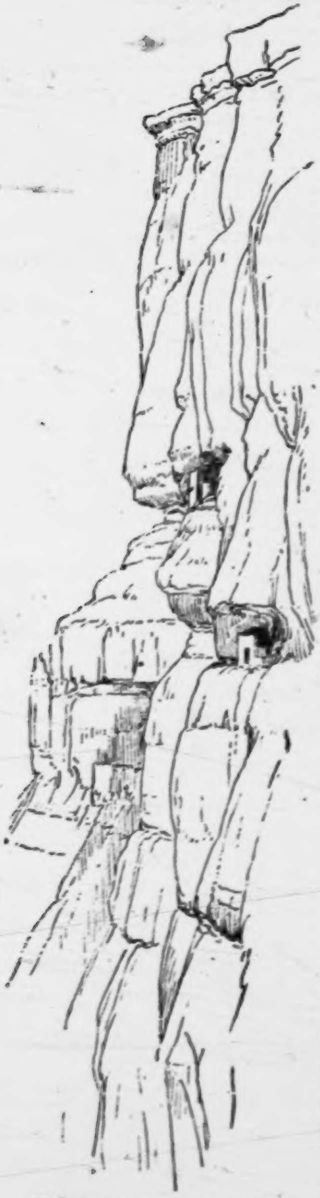
* See Fig. on page 1-1, Hayden's Report, 1876, page 391.



CLIFF WITH HIGH HOUSES.

best preserved specimens of the ruined towers and seems to have been built with much skill. It is nine feet in diameter on the inside, and about sixteen feet high. There are three rectangular apartments attached. In the side of the tower facing the river is a window about eight feet from the ground. This may have served as a doorway between the tower and one of the adjoining apartments. The advantage of such an arrangement in defensive works is clearly apparent, and evinces not a little intelligence and forethought on the part of the builders. Being built in connection with dwellings and places of resort, they could, in case of alarm, be reached with ease from within, and be altogether secure from without.*

III. This leads us to consider the number and location of the towers. We have seen that they are very numerous in the valley of the San Juan, and especially so on the Mancos; some are on the higher promontories; others quite low, within twenty or thirty feet of the river bed. Mr. Holmes visited and measured seven along the lower fifteen miles of the course of this stream. In dimensions they range from ten to sixteen feet in diameter, and from five to fifteen feet in height, while the walls are from one to two feet in thickness. They are in nearly every case connected with other structures, mostly regular rectangular in form. At the mouth of the Mancos, however, a double circle occurs, the smaller one having been the tower proper. It is fifteen feet in diameter, and from eight to ten feet in height. The larger circular wall is forty feet in diameter, and from two to four feet high, and is built tangent to the smaller. This ruin is at the point where the Mancos reaches the alluvial bottom, bordering the Rio San Juan, and about one mile above its junction with the river. On the opposite or south side of the river are traces of somewhat extensive ruins, but so indistinct that the character of the original structures cannot be made out. " No single mile of the Mancos is without such remains."

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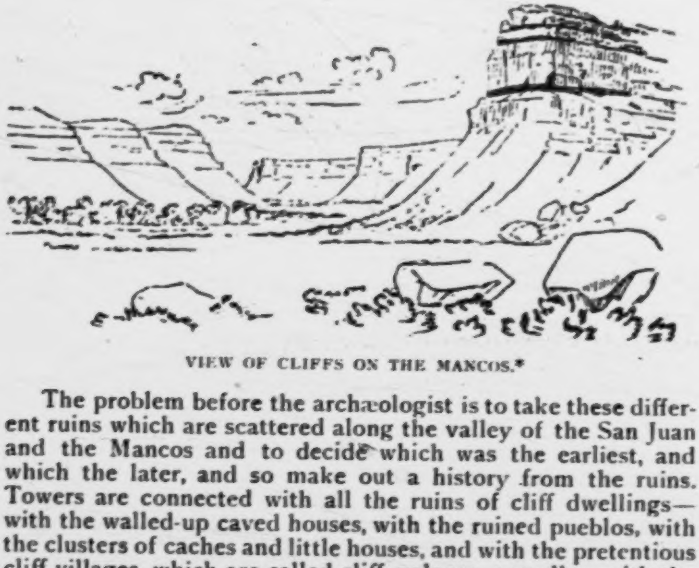
* See Holmes' Report on the Ancient Ruins for 1875-76, page 391.

This distribution of the towers along the Mancos and of the ruins near them is very suggestive. It appears that there were different periods in which the Cliff-Dwellers continued to occupy this border land of the Pueblo territory, and throughout them all, they were constantly subject to attacks from an ever increasing foe which came down from the north. There is, to be sure, no record of these attacks, or of the changes which they produced, except such as archæology gives; yet, judging from the different structures which are now in ruins, we conclude that the occupation had lasted for many centuries, and that through them all the same danger continued.



VIEW OF CLIFFS ON THE MANCOS.*

The problem before the archæologist is to take these different ruins which are scattered along the valley of the San Juan and the Mancos and to decide which was the earliest, and which the later, and so make out a history from the ruins. Towers are connected with all the ruins of cliff dwellings—with the walled-up caved houses, with the ruined pueblos, with the clusters of caches and little houses, and with the pretentious cliff villages, which are called cliff palaces, as well as with the high houses.

There are places where there are no signs of either cave-towns or ruined pueblos or cliff palaces, but the houses are scattered around in the niches of the rocks without any sign of their being connected. Here there were look-out towers, which were built on the summit of isolated rocks, almost inaccessible, and the wonder is to what use they were put. If the people were driven to such straits as to build towers on the isolated rocks, what would become of their stores and their families in case of attack? It may be that they were look-outs, designed to watch the approach of an enemy and to give warning to the people, or they may have been used as lodging places for the men. There is a mystery about these isolated towers which were connected with the scattered houses, and yet they furnish a hint as to the pertinacity with which the people clung to their old habitat. There were houses which were probably used as summer resorts or stations where the people from the pueblos dwelt during the summer, while they carried on their agricultural pursuits in the valley. The two-story house in the Cañon de Chelly was of this character. These towers which we are describing, are generally associated with houses of the cave kind, which were very numerous, as can be seen from the following description by Mr. Jackson:

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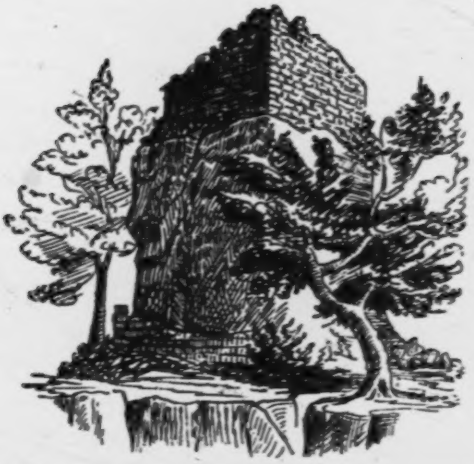
*This cut shows the shape of the cliffs in which the high houses are situated. The dark lines near the top show the height of the houses above the valley.

The cut on the preceding page illustrates the steepness of the cliff in which the high houses were built and the situation of the houses in the niches described on pages 82, 87 and 126.

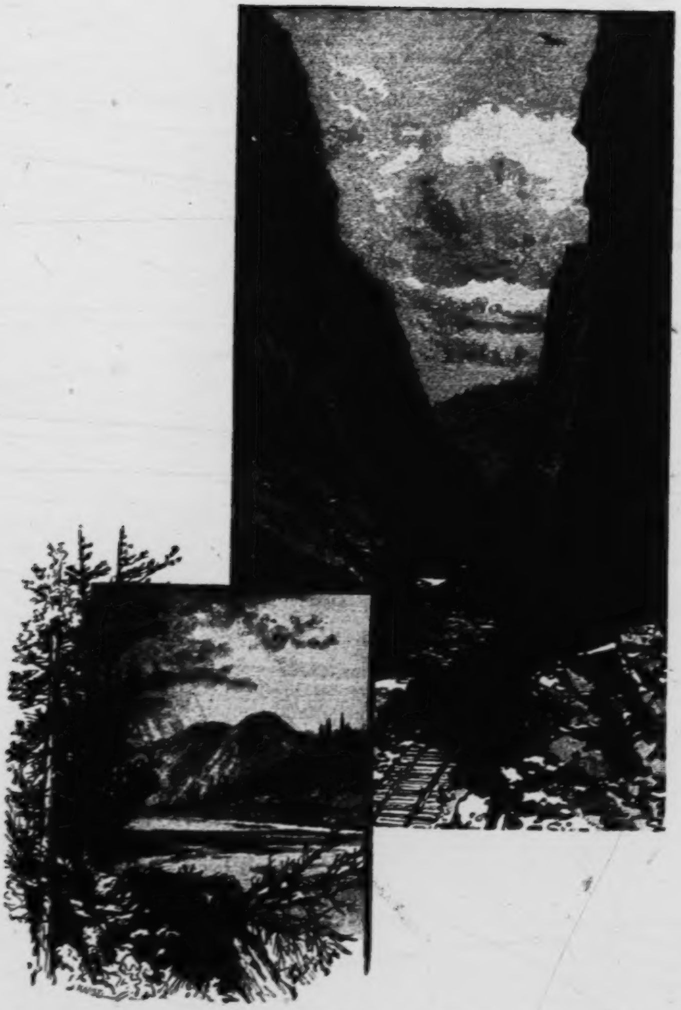


SQUARE TOWER ON THE MANCOS.

> We found them numerous enough to satisfy our most earnest desire, although not of the importance of the greater ones of the San Juan and De Chelly. All were of the small cave kind, mostly mere "cubby holes," but so smoke-blackened inside and showing other marks of use, as to convince us they had been long occupied, but not during any comparatively recent period. In the generality of cases, they were on small benches, or in shallow caves situated near the bed of the stream, but the further up we went, the higher they were built. In one instance a bluff, several hundred feet in height, contained half a dozen small houses, sandwiched in its various stratas, the highest being up 150 feet; each of but one room, and one of them a perfect specimen of adobe-plastered masonry, hardly a crack appearing upon its smoothly stuccoed surface. A short distance up from the entrance to the canyon, a square tower has been built upon a commanding point of the mesa, and in a position, so far as any means at our command are concerned, perfectly inaccessible.
>
> Upon the opposite side of the main Epsom Creek Valley and on top of the high bluffs of sandstone, we found cave houses, divided into four or five apartments of just the size and number that would be required for an ordinary family of eight or ten persons. On the top of the bluff, we found the remains of a very old circular tower, forty feet in diameter, the stones all

crumbled, rounded and moss covered. Near-by were the remains of two other cave habitations. A few miles further up the Epsom Valley, we came upon an important group that was evidently the centre of the surrounding population, an aboriginal town. Upon the edge of the ravine was a round tower, twenty-five feet in diameter, and seventy-five feet below was a square building. On the opposite bank, were two small round towers, each fifteen feet in diameter, with two oblong structures, twelve by fifteen feet, and another square building.

Such is the account of the high houses and towers which were discovered and described by the early explorers. We learn from it, many things about the former condition of the mysterious people, who are called the Cliff-Dwellers. It appears that they were a peaceable sedentary people, who had been dependent upon agriculture for their subsistence, and who perhaps were allied to the Pueblos who dwelt far to the south; but had long made their homes in the rich valleys of the streams which flowed through the mountains. They dwelt here, and here they built their houses, first in the valleys, and deposited their crops in the caches which were furnished by the cavities in the rocks near-by. From these, they were driven by the wild tribes, such as the Utes, possibly the Navajos, who came down upon them in increasing numbers. They then fled from their homes and built anew on the mesas, leaving their former habitations to go to ruin. These houses became unsafe, so they were compelled, as a last resort, to break up their villages, which had been concentrated in the valleys, and scatter their families; building homes for the women and children high up in the sides of the rocks, where the enemy could not reach them. The men remained in the valleys, and continued to carry on their accustomed employments. They continued in this way through many seasons, but the repeated attacks of their enemies compelled the men to build towers in the most inaccessible places and there station bands which would constantly act as watchmen. These towers were probably reached by rope ladders, and may have served as sleeping places for the men. There came a time, however, when the constant presence of their enemies prevented them from tilling the fields or gathering subsistence from any source, and they were compelled to leave the region altogether and make their homes elsewhere.



ROYAL GORGE AND TOLTEC PASS.

By courtesy of Denver & Rio Grande Railway.

VIEW DOWN THE CLIFF CANON.

# CHAPTER VII.

## THE CLIFF PALACE AND ITS SURROUNDINGS.

The descriptions given of the so-called "High Houses and Round Towers," which were discovered, in 1874, by Holmes and Jackson, in the valley of the San Juan, lead us to consider the cliff dwellings and ruined pueblos discovered since that time. It would seem that notwithstanding the great interest which was taken in these accounts, very few persons visited the region, or; if they did, they published no record, except Mr. L. H. Morgan, who made a hasty trip in 1877, and wrote a description of the ruins on the Animas and the McElmo. The chief work which has been done since that time has been accomplished by private parties.

Mr. F. H. Chapin visited the region in 1889 and 1890, and took photographs of several of the cliff houses including the Cliff Palace. He published the account of his expedition in the Journal of the Appalachian Club and in the AMERICAN ANTIQUARIAN, afterward published in a beautiful book*

He was followed by Dr. J. P. Birdsall, who spent a few weeks in the same region, and wrote a description of his explorations for the Geographical Society of New York, a part of which was published in the American Autiquarian.

The person who accomplished the most in the way of exploring, measuring and describing the cliff dwellings of this region was Nordenskjold, of Stockholm, Sweden. He was visiting America, and expected to spend only a few days among the cliff dwellings, but he became so much interested that he employed a number of men and thoroughly examined the ruins in the cliff canon and vicinty. He took photographs of the ruins, measured the rooms made plats and ground plans and afterward published a large quarto volume in two languages, Swedish and English.

He was followed by a party of young men who were employed by the Illustrated American, and were led by Mr. W. K. Moorehead. Mr. Lewis W. Gunckel belonged to the party, and furnished some very interesting and valuable accounts of the ruins and the pictographs. This party began their explorations on the Animas, in the same region where Mr. J. G. Birney and Mr. L. H. Morgan had discovered a large communistic house, or pueblo, of the "honey-comb pattern." They passed along the Rio San Juan to the junction of the McElmo and Hovenweep, where were located most of the ruins described by Mr. W. H. Holmes. Here Mr. Gunckel took drawings of rock inscriptions and made plates of some of the ruined pueblos. The party then moved westward and visited a number of cave towns and isolated dwellings situated in the Box canons, giving names to the villages and towns. No definite description of these has ever been published except in the Illustrated American. We purpose in this article to go over in review explorations in the Cliff canon and give a summary of the results which were reached, leaving the more definite description of the ruins in other localities to a future paper. We use the title "Cliff Palace and Its Surroundings" because of the fact that these names were given to the most interesting ruins discovered, There were also in connection with these ruins a large number of "estufas," or "kivas," which were in reality temples—at least the only temples known to the Cliff-dwellers or Pueblos.

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*See American Antiquarian Vol. XII.

We shall begin with Mr. Chapin's account. He says: "The spires of the San Juan ranges had exercised a powerful fascination on me from the moment I first beheld them far to the eastward, in scaling the savage aretas of the Sierra Blanca. The spell became more fixed when, after a year's interval, emerging from the canon Gunnison, I saw the snowy summits piercing the blue sky only a score of miles to the southward. It was at its maximum as, leaving the main transcontinental line at Montrose, our little train sped directly toward them, giving us constant views, now, on the left of the castellated ridges of mighty Umcompahgre, now, on the right, of the peaks about Ouray, culminating in Mount Snaefell, whose form was barely traceable through the smoky haze that seemed to magnify its altitude.*

FIG. 1—TOLTEC GORGE.

Mr. Chapin first described the ruins in the Acowitz Canon, which joins the Mancos from the east. He says:

> "It is one of the finest of all the side ramifications, and contains antiquities well worth investigating. A good Indian trail traverses the whole length of Mancos Canon, and similar paths lead for some distance up its branches; but to visit the remote ruins it is much easier to ascend the walls of the same canon to the surface of the mesa, cross the plateau and thus strike the tributaries up toward the beginnings. The ruins which we propose to photograph is situated on the western cliff of Acowitz Canon. We

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*See Chapin's "Land of the Cliff Dwellers.

The following is a list of photographs of Cliff dwellings and ruins furnished by Mr. Chapin:

1. General view of Mancos canon.
2. Tower in Mancos canon.
3. SandalCliff-House, estufal in Sandal Cliff-House and Interior
4. Plan of first Cliff dwelling visited.
5. Fortification at Acowitz canon; also small Room lookout on upper ledge. Primitive grindstone and plan of the Cliff-house.
6. An Impregnable Fort.
7. Cliff Palace, front view; ditto from opposite side; interior of round Room; mural decoration and north end of cliff palace and tower and T-shaped doorway.

here found a wall which must have been used as a fortification. Stepping over the tumble-down walls and looking over the precipice, we found hewn steps on which we reached the bottom of the way. A strange, wild, lonely canon. No sounds were heard to disturb the scene but the croaking of ravens as they flew over our heads. The great arched cliff hangs high above the ruins, but a little way from it the canon ends in sheer solid walls, which sweep round in a curve. Looking all about, we see but one exit above, and that by the steps which we had descended. Perched in a little cleft over our heads was a second group of buildings, apparently inaccessible, and in good repair.

On the south corner is a curious little building, to which there is one entrance. This, one would take for a window, but that no light could pass through it when the whole wall was standing. It was a fascinatingly queer place. We were struck with the strength of the position, and believed that we could have kept in check a small army of combatants. We noticed some peculiar arrangements. One was a sort of a low cubby-hole, outside of the main structure [Fig. 5], 8 feet front and 5 feet deep, with two little doors. This may have been used as a store-room. We found much broken pottery. One of the central rooms is well plastered, and is as smooth as a modern wall. A round room had piers below the ground floor. These also were plastered, and there were little recesses in the sides of the wall, which may have been used as shelves. There were some interesting grooves on a ledge of smooth sandstone. These grooves in the rock were made by the natives in sharpening their tools. Most of them were large and were probably used for grinding all edges. On another ledge we observed smaller ones where knives, awls and needles were whetted. One remarkable thing, which showed the eccentricity of the builders, was a room which appeared to have no entrance; in fact, I walked around it without discovering I had passed a room. A little investigation revealed an entrance at the top. The enclosure was 8 feet square; the entrance, a hole 17½ inches square. The ceiling was plastered over, and was very firm. [Fig. 6.]

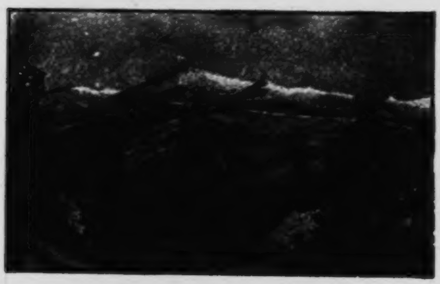
FIG. 2.—SCENERY IN MARSHALL PASS.

We discovered some houses in the Fourth Fork of Acowitz canon. Here stands a good circular room, with two doors. On the sand plateau, near the brink of the gorge, is the most remarkable crevasse that I ever saw. It made me shudder to look into it, though standing on the edge of a high cliff would produce no such sensation. From a pocket of the canon we had a remarkable view of the whole length of Acowitz to the Mancos, and than, through that depression, that magnificent mesa, which stands above the river's place of exit. It was a truly sublime sight. The nearer scene is a wild one: quaking aspens grow in the upper part of the gorge, and in the bottom are tall, stately pines, which climb to the top walls and were even with our eyes as we looked across the canon."

Mr. Chapin next describes the location of the Cliff Palace. He says,

"The honor of the discovery of the remarkable ruins to which the name "Cliff Palace" has been given, belongs to Richard and Alfred Wetherell,* of Mancos. The family own large herds of cattle which wander about on the mesa verde. The care of these herds often call for long rides on the mesa and through the labyrinth of canons. During these long excursions many magnificent ruins have been discovered. Narrow, winding defiles, precipitous, bold headlands and overhanging ledges are the characteristics of one canon, called the Cliff Canon.

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*These gentlemen, in company with Messrs. Charles McLoyd, L. C. Patrick and J. H. Graham, during the winters of 1888-9, explored the entire region along the Mancos, penetrating into the canon, with the view of collecting relics. Up to March, 1890, they had examindd in all 182 houses. They visited 106 houses in Navajo Canon alone, and worked 250 miles of cliff front.

"On reaching the bank of the canon opposite the wonderful structure, the observer cannot but be astonished at the first sight of the long line of solid masonry which he beholds across the chasms, here but a thousand feet wide. In the first burst of enthusiasm it strikes one as being the ruins of a great palace, erected by some powerful chieftain of the lost people. The best time to see the ruins is in the afternoon, when the sun is shining into the cavern. The effect is much finer than when viewed in the morning. Surely its discoverer did not exaggerate the beauty and magnitude of this strange ruin. It occupies a great space under a grand oval cliff, appearing like a ruined fortress, with ramparts, bastions and dismantled towers. The stones in front have broken away, but behind them rise the walls of a second story, and in the rear of these, under a dark cavern, stands the third tier of masonry. Still farther back in the gloomy recess, little houses rest on upper ledges. [See Fig. 3.] A short distance down the canon are cosy buildings, perched in utterly inaccessible nooks. [See Fig. 4.]

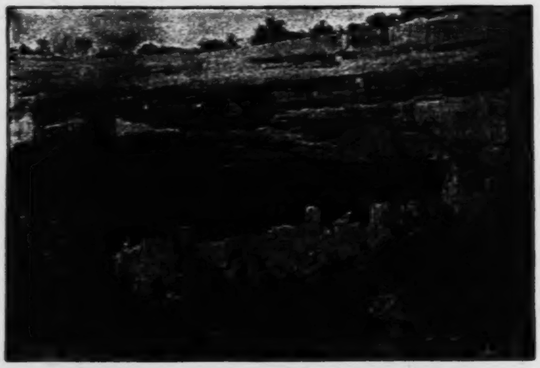

FIG. 3. CLIFF PALACE, SIDE VIEW.

"The scenery is marvellous. The view down the canon to the Mancos is alone worth the journey to see. To reach the ruins, one must descend into the canon from the opposite side What would otherwise be a hazardous proceeding is rendered easy by using the steps which were cut into the wall by the builders of the fortress. There are fifteen of these scooped-out hollows in the rock, which cover, perhaps, half the distance down the precipice. One wonders at the good preservation of these hand-holes in the rocks; even small cuttings to give place for a finger are sometimes placed exactly right, even in awkward places. It is evident why they were so placed, and that they have not been changed by the forces of the air in sev-

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Many ruins were found in unsuspected places. Many were worth a visit, just to look at. Some appeared comparatively new; others as if they had been long occupied; and still others were much dilapidated, scarcely a vestige remaining. They commenced their excavations at the first Cliff-house in Mancos Canon, to which the name Samdal Cliff-house was given. This has been described by Mr. Chapin, and several illustrations of it are given in his book. They penetrated the depths of the Cliff canon and from this, and other places, gathered a large collection of relics, which were first placed in the Historical rooms at Denver, but were afterward sold to Rev. J. H. Green, who placed them on exhibition at the World's Fair and then sold them to the University of Pennsylvania.

eral hundred years that have probably elapsed since they were chipped out by an axe made of firmer rock. There occurs to my mind but one explanation of their preservation: erosion by wind is one of the factors in chiseling rock-forms about the Mancos, and as we observe sand in these hollows, we suppose the wind at times keeps the grains eddying round, and thus erosion in the depression keeps pace, perhaps even gains, on the rate of denudation of the smooth cliff.

"It takes but a few minutes to cross the bed of the canon. In the bottom is a secondary gulch, which requires care in descending. We hung a rope, or lasso, over some steep, smooth ledges and let ourselves down by it. We left it hanging there and used it to ascend by on our return Nearer approach increases the interest in the marvel. From the south end of the ruin, which is first attained, trees hide the northern walls, yet the view is beautiful. The space covered by the building is 425 feet long, 80 feet high in front, and 80 feet deep in the center, and 124 rooms have been traced out on the ground floor. So many walls have fallen that i' is difficult to reconstruct the building in imagination, but the photograph shows that there must have been several stories: thus a thousand persons may easity have lived within its confines. There are towers and circular rooms, square and rectangular enclosures, all with a seeming symmetry, though in some places the walls look as if they had been put up as additions at later periods. One of the towers is barrel shaped; others are true cylinders. The diameter of one room, or estufa, is 16½ feet; there are six piers in it, which are well plastered, and five recess holes, which appear as if constructed for shelves. In several rooms are good fire-places. One of our party built a fire in the largest one, which had a flue, but found the draught too strong for his light wood, and came near going up with the smoke. In another room, where the outer wall had fallen away, an attempt was made at ornamentation. A broad band had been painted across the wall, and above it a peculiar decoration, the lines of which were similar to embellishment on the pottery. In one place corn-cobs were embellished in the plaster, the cobs as well as the kernels of corn were of small size, similar to that which the Ute squaws raise without irrigation. Besides corn, it is known that the Cliff-dwellers raised beans and squash. We found a large stone mortar, which may have been used to grind the corn. Broken pottery was everywhere present. Specimens similar to those we had collected in the valley ruins convincing us of the identity of the builders of the two classes of houses. We found parts of skulls and skeletons, and fragments of weapons and pieces of cloth. The burial place of the clan was down under the rear of the cave.

FIG. 4. CLIFF PALACE, SIDE VIEW.

Notwithstanding the imposing name which we have given it, and which its striking appearance seems to justify, it was a communistic dwelling, or clan village. There is no hall leading through it, and no signs that it was a home prepared for the ruler of a people. It owes its beauty principally to the remains of two towers, and its magnitude to the fact that the length of the platform (ledge) and depth and height of the natural arch allowed of such a building in such a remote quarter. This large, open cave, as well as others in this region, are natural, and do not appear to have been enlarged in any way by man." *

Mr. Chapin also visited a number of other cliff dwellings, several of them in the Navajo canon, a branch of the Mancos canon. To these names have been given, which are descriptive of their peculiarties. He speaks of one which is well preserved and which, perched high up on a cliff, looks as if newly constructed. To this the name of "Balcony House" has been given, as timbers project from the high walls. In another canon are three interesting ruins in close proximity. In one of these houses is a fire-place which has a raised hearth and fender. In another house is an estufa, where there is a fire-place once honored with a chimney.†

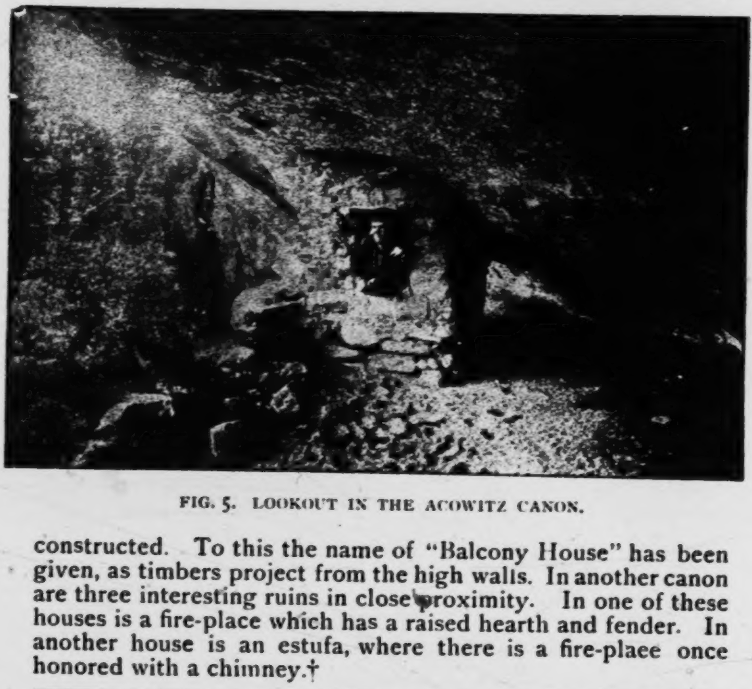

FIG. 5. LOOKOUT IN THE ACOWITZ CANON.

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*There are few caves in the valley of the San Juan and the Mancos, which seem to have been deepened and walled up, descriptions of which have been given by W. H. Holmes and Mr. Jackson. A large number of such caves are found on the Salado river to the southwest of this, and on the headwaters of the Gila river, and the tributaries of the Rio Grande. These have been described by Mr. A. F. Bandelier, Maj. J. W. Powell, Charles F. Lummis, Victor Mindcliff. None of these present any such specimens of architecture as the Cliff Palace.

†Fire-places have been rarely observed among the Cliff dwellings. Mr. Holmes describes one in the Mancos canon. Mr. Walter J. Fewkes describes fire-places found in the ruins near Zuni. Mr. F. F. Bickford says [Century Magazine, Oct., 1890], in describing ruins on the Chaco, neither fire-places nor flues are to be found, and it is probable that fires were never built in the living apartments. Fire-places were found in nearly all the estufas, and an air chamber connecting the estufa with the outside air in such a way as to make a draft through the estufa, and thus carry the smoke up throug the opening in the roof.

The "Spruce Tree House" was another ruined building which he photographed and described in his book. His description of this is as follows:

"About the best preserved specimen of a cliff-dwelling eyrie —at least one that retains more features of interest than many of the other ruins—is one that is situated in a right-hand branch of the second large right-hand fork of Navajo canon. It is about three hundred feet long. Under a natural sheltering rock, remains of three stories are standing. Originally the building was probably five stories high, and was built in the form of a terrace, the two lower tiers having been built outside the limits of the arch, and lower than the platform of the cave, so that what we now see standing are the three upper stories, The lower parts of the edifice, more exposed to weatherings have mostly crumbled away. The entrance to apartments in the cave was probably made by passing over the top of the outside buildings.

FIG. 6. ESTUFA WITH AIR FLUE.

"The masonry of the building is all of very good order; the stones were laid in mortar and the plastering carefully put on, though, as the centuries have elapsed, it has peeled off in certain spots. At the north end of the ruin is a specimen of masonry not to be seen in any other cliff house yet discovered. This is a plastered stone pier which supports the wall of an upper loft. It is ten inches square and about four feet high. Resting on it are spruce timbers, which rnn from an outer wall across the pier to the back of the cave. Above the pier is a good specimen of a T-shaped door with lintel of wood and sill of stone.

The largest cliff-dwelling described by Mr. Chapin is one to which he gave the name of the "Loop-Hole Fortress." He describes it as follows:

"There is another mighty arch in one of the Navajo canons which shelters a ruin well worthy of description. The building is visible from the brink of the canon, as one journeys up its length. To find a place to descend, one must round the head of the canon and follow a long winding route over and under ledges to the canon bed. The noble arch rises a hundred feet above the natural platform. The sloping bed of the canon reaches to the base of this platform, which rises like a terrace to a height of about twenty feet. Trees and bushes grow up to the base of the ledge. The ledge is approximately 480 feet long, as we determined by pacing. This is the largest cliff-dwelling yet discovered in this region. The front walls were built upon the rim of the platform, which is curved to the general form of the ampitheatre, and gives the building the appearance of an impregnable fortress. The walls of solid masonry remain firm, and present an imposing front. In the center the stones have broken away in such a manner as to leave standing a high wall, which gives a gothic appearance to the ruin.

"At one end three stories remain standing; the upper room is squeezed in under the arch and was entered by a low door. These high-standing walls show how the cliff dwellings were originally constructed. They reached to the roof of the cave, and were necessarily higher in front than in the rear, for the cliffs make over them an arch which served as a natural roof. As first built, much more space than the platform was utilized, and a lower terrace occupied. Walls that divided rooms and formed the ends of the structure run down among the trees and bushes; the lateral walls have all fallen down. In some places, where the ground is steeply inclined, the stones of the ruin lie like a talus on a mountain-side.

"On ledges above the main edifice are smaller buildings, and in one cranny is a long, low structure, with thirteen loopholes in front and two at the end. Those in front open at different angles, so that any approach from below could be observed by the watching cliff-climbers. From this fact I have named this ruin the "Loop-Hole Fortress." This ruin, if undisturbed, will doubtless remain for centuries in about its present condition, and cannot but fascinate the archæologists who shall chance to visit it. Perhaps these same ruins, if placed on a plain, or in a quiet valley, would not appeal so strongly to our sense of the marvellous. Here, in a remote canon, far from the river, far from water of any kind, with high frowning walls upon three sides and an untracked ravine below it, one wonders why the lost tribes should have selected such a place for their home.

"The standing masonry, in itself, is of interest. The solid front does not give the idea of patchwork, as presented in many of the buildings of the Cliff-Dweflers. Standing on the parapet and looking along the front line, there is not a break to be seen in its continuity, except as the platform bulges in or out. Save that the stones were already at hand, shapen by the elements as they had broken off from the cliffs and overhanging ledges, the marvel would be greater that a people, with only stone and wooden tools, could have accomplished such a work. The light of noonday floods the walls of the ramparts and penetrates into the deep recesses of the cave, but as the sun sinks westward a dark shadow creeps across the front of the caver and the interior is deep gloom. It is then that the explorer, standing among the crumbled walls and gazing up at the loop-holes above, or following with his eye the course of the canon down to its end where it joins the greater gorgef wonders what events happened to cause this strong fortress to be deserted or overthrown. There must have been a fearful struggle between a people who were emerging from barbarism, and more savage hordes, or some great catastrophe of Nature overwhelmed them."

Mr. Nordenskjold's description of the Cliff Palace corresponds to that given by Mr. Chapin, but is more complete. In a long but not very deep branch of Cliff canon, and near a wild and gloomy gorge lies the largest of the ruins on the mesa verde. Strange and indescribable is the impression on the traveler, when, after a long and tiresome ride through monotonous pinon forests, he suddenly halts on the brink of the precipice and in the opposite cliff beholds the ruins of the Cliff Palace, framed in the massive vault of rock above, and in a bed of sun-lit cedar and pinon trees below. This ruin well deserves its name, for with its round towers and high walls rising out of the heaps of stones deep in the mysterious twilight of the cavern, and defying, in their sheltered site, the ravages of time, it resembles, at a distance, an enchanted castle.

The Cliff Palace is probably the largest ruin of its kind known in the United States. In the plate which represents the whole series, over a hundred rooms are shown. About twenty of them are estufas, Among the rubbish and stones in front the ruin are a few more walls not marked in the plan. The stones are carefully dressed, and often laid in regular courses; the walls are perpendicular, sometimes leaning slightly inwards at the same angle all around the room, this being part of the design, All the corners form almost perfect right angles when the surroundings have permitted the builders to observe this rule. This remark also applies to the dwellings, the sides of which are true and even. The lintel often consists of a large stone slab, extending right across the opening. On closer observation we find that in the Cliff Palace we may discern two slightly different methods of building. The lower walls, where the stones are only rough hewn and laid without order, are often surmounted by walls of carefully dressed blocks in regular courses. This circumstance suggests that the cave was inhabited during two different periods.

The rooms of the Cliff Palace seem to have been better provided with light and air than the cliff dwellings in general, small peep-holes appearing at several places in the walls. The door-ways, as in other cliff-dwellings, are either rectangular or T-shaped.[*]

Mr. Nordenksjold lays great stress on the skill to which the walls of the Cliff Palace bear witness, and the stability and strength which has been supplied to them by the careful dressing of the blocks and the chinking of the interstices with small chips of stone.. A point remarked by Jackson in his description of the ruins of southwestern Colorado, is that the finger-marks of the masons may still be traced in the mortar, and that these marks are so small as to suggest that the work of building was performed by women.

Like Spruce Tree House, and other large ruins, the Cliff Palace contains at the back of the cave extensive open spaces, where tame turkeys were probably kept. In this part of the village three small rooms, isolated from the rest of the building, occupy a position close to the cliff; two of them built of large flat slabs of stone, lie close together; the third, of unhewn sandstone, is situated farther north. These rooms may serve as examples of the most primitive form of architecture among the Cliff people.

In the Cliff Palace, the rooms lie on different levels, the ground occupied by them being very rough. In several places terraces have been constructed, in order to procure a level foundation, and here, as in their other architectural labors, the Cliff-dwellers have displayed considerable skill.[†]

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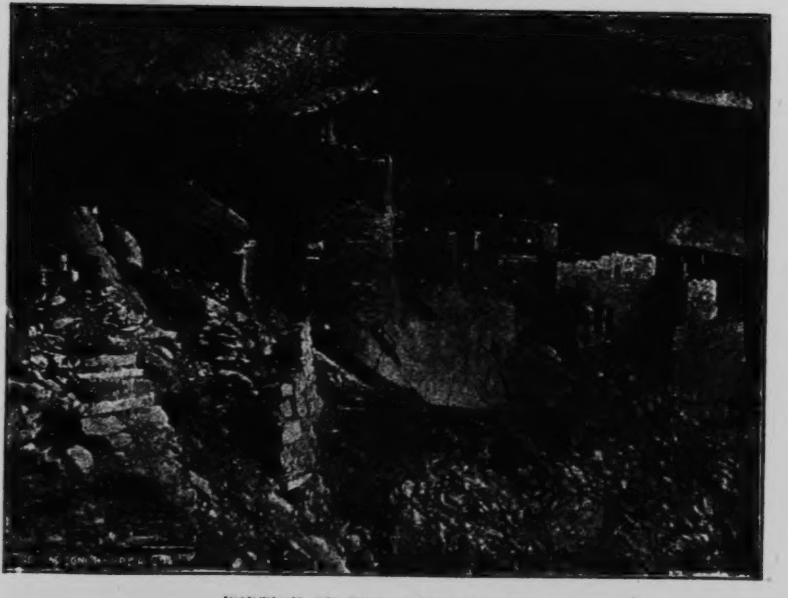
[*] Some of the latter are of unusual size; in one instance 1.05 m. high and 0.61 m. broad at the top. The thickness of the walls is generally about 0.13 m., sometimes, in the outer walls, as much as 0.65 m. As a rule they are not painted, but, in some rooms, covered with a thin coat of yellow plaster.

[†] The plate, as I have justmentioned, is a photograph of the Cliff Palace from the north To the extreme left of the plate a number of much dilapidated walls may be seen. They corrsepond to rooms 1-12 in the plan. To the right of these walls lies a whole block of rooms (13-18) several stories nigh and built on a huge rock, which has fallen from the roof of the cave. The outermost room (14 in plan; to left in plate 13) is bounded on the outside by a high wall, the outlines of which stand off sharply from the dark background of the cave. The wall is built in a quadrant at the edge of the rock just mentioned, which has been carefully dressed, the wall thus forming apparently, an immediate continuation of the rock. The latter is coursed by a fissure, which also extends through the wall. This crevasse must, therefore, have appeared subsequent to the building operations. To the right of this curved wall four rooms and in front of them two terraces connected by a step. One of the rooms is surrounded by walls three stories high, and reaching up to the roof of the cave. The terraces are bounded to the north by a rather high wall, standing apart from the remainder of the building. Not far from the rooms just mentioned, but a little further back, lie two cylindrical chambers The round room is joined by a wall to a long series of chambers. which are very low, though thick walls extend to the rocks above them. They probably served as store-rooms. These chambers front on a "street," on the opposite side of which lie a number of apartments, among them a remarkable estufa. In front lies another estufa, and not far from the latter a third.

CLIFF PALACE, SIDE VIEW—IN CLIFF CANON.

SQUARE TOWER IN THE CLIFF PALACE.



PORTION OF THE CLIFF PALACE.

Not far from Cliff Palace, Mr. Nordenskjold found the remarkable and extensive cliff-dwelling, which he called "Balcony House." The following is his description:

This cliff dwelling is the best preserved of all the ruins on the Mesa Verda. It also seems as if the architecture of the Cliff people had here reached its culminating point. Still more care has been bestowed on the erection of the walls in general than in the Cliff Palace. Balcony House occupied a better position for purposes of defense than the other large ruins described. A handful of men, posted in the cliff-house, could repel the attack of a numerous force. At the south end of the ruin, additional precautions have been taken for the strengthening of its defense. A very narrow cleft, which forms the only means of reaching the south part of the ledge, has been walled up to a height of nearly 16½ feet. The lower part of the wall closing this cleft is pierced by a narrow tunnel. Through this tunnel a man may creep on hands and knees from the cliff dwelling to the south part of the ledge. The latter affords a footing, with the precipice to the left and the cliff to the right, for about a hundred paces, the ledge being here terminated by the perpendicular wall of the canon. The ruined walls of a strong tower, built to cut off approach on the side, may still be traced. A supporting wall has been erected on a lower ledge, to form a stable foundation for the outer wall of the upper rooms, where the higher ledge was too narrow or too rough for building purposes, The total height of the wall has thus been raised to 6.5 m. South of the room fronted by this wall is a small open court, bounded at the base by a few very regular and well-preserved walls, which rise to the roof of the cave. On the outer side the court is enclosed within a low, thick wall, built on the edge of the precipice. The second story is furnished, along the wall just mentioned, with a balcony, the joists between the two stories project a couple of feet, long poles lie across them parallel to the walls, the poles are covered with a layer of cedar bast and finally with dried clay. This balcony was used as a means of communication between the rooms in the upper story. The roof of the rooms just north of this point is constructed in the same manner as the balcony just described. It projects a few feet beyond the walls on two sides, forming a spacious platform. In most of the cliff-dwellings the roofs probably consisted of similar platforms, and it was presumably here that the cliff-dwellers spent most of their time and performed their household duties, as the custom is to the present day among the Moki Indians of Arizona. Near the cliff, between the platform and the balcony, is a deep hole, forming a small passage; through which it is possible to descend by the aid of some pegs driven into the walls, to a narrow ledge. Ladders seem, as mentioned above, to have been seldom employed by the Cliff-people. The perilous climbs, that formed a part of their daily life, had inured them to difficult pathways.

The staple industry of the Cliff-people was the cultivation of maize. This may be gathered from the plentiful remains of this cereal to be seen everywhere in the cliff-dwellings and their neighborhood. Well-preserved ears of maize are sometimes found in the ruins. They belong to several varieties, and are yellow or reddish brown.

Besides maize, the Cliff-dwellers cultivated beans of a brown variety, solitary specimens of which I found in some ruins, and probably some species of gourds. The stalks of the latter are common; bits of the rind are also found, and, more seldom, the seeds. Cotton was used by the Cliff-dwellers, as the raw material of superior textile fabrics, numerous fragment of cotton cloth, have been found. The cotton shrub was probably cultivated by the Cliff-people. at least in some localities, for in the cliff-dwellings of southern Utah the seeds of this shrub have been observed,

The yucca plant afforded an excellent raw material for rope, cord, and coarse woven fabrics. This plant, which is extremely common both on the mesa and in the beds of the canons, has long, narrow, sharp leaves, composed of long and very tough fibres.

The animal kingdom, too, was laid under contribution for miscellaneous purposes. Several circumstances lead us to the conclusion that the Cliff-dwellers kept tame birds, probably the turkey, in a domesticated state. This bird probably supplied the down of which the so called feather cloth, or rather down cloth, was made, for the maierial consists of the humeral quill-coverts of a gallinaceous bird.

Among a variety of implements, awls are the most common. They are found in great numbers in all the cliff dwellings, and also among the fragments of pottery in the barrows on the mesa. They were made of the bones of birds and small mammals, and sharpened on the face of the sandstone cliff.

Mr. Nordenksjold also explored a group of ruins situated in Cliff canon, to which he gave the name of the "Long House," though this is the same ruin which Mr. Chapin calls the "Loop Hole Fort," as the situation of the buildings on the ledge of rocks and the presence of certain loop-holes through the walls suggested the idea that it was both a dwelling and a fortress, though Mr. Mindeliff claims that the cliff houses were not fortresses, but were temporary residences. The following is the description of the fortress, what he calls the "Long House:"

"From the bottom of the canon we force our way through dense, thickets some hundreds of feet up the slope. Here we reach the deep cliffs, rising ledge upon ledge, to the mesa. The ruin lies upon one of the lowest ledges, and the climb, though troublesome, is attended with no serious difficulties,

"Among half ruined walls and heaps of stones, we can distinguish eleven different rooms, lying in an irregular row along the narrow shelf close to the edge of the precipice, and sheltered by the overhanging rock. The way by which we have climbed has led us first into a circular room, or estufa, still in a fair state of preservation. The wall that lies nearest the precipice is, for the most part, in ruins; the rest of the room is well preserved. After about half a metre of dust and rubbish had been removed, we were able to ascertain that the walls formed a cylinder 4.3 metres in diameter. The thickness of the wall is considerable and varies, the spaces between the points where the cylinder touches the walls of the adjoining rooms having been filled up with masonry. The height of the room is 2 m. The roof has long since fallen in, and only one or two beams are left among the rubbish. To a height of 1.2 m from the floor the wall is perfectly even and has the form of a cylinder, or, rather, of a truncate cone, as it leans slightly inwards. The upper portion is divided by six deep niches into the same number of pillars. The floor is of clay, hard and perfectly even. [See Fig. 6.] Near the center is a round depression, or hole, entirely full of white ashes, undoubtedly the hearth. Between the hearth and the outer wall stands a narrow curved wall, 8 m. high. Behind this wall, in the same plane as the floor, is a rectangular opening, which forms the mouth of a narrow passage or tunnel, which runs in horizontal direction, and then goes straight upwards out into the open air,*

The wall between the hearth and the singular passage, or tunnel, is replaced by a large slab of stone, set on end. It is difficult to say for what purpose this tunnel has been constructed, and the slab of stone or the wall erected in front of it. As I have mentioned above this arrangement is found in all the estufas. The entrance to the estufa was probably in the roof.

Excavations were begun. Among the many objects discovered were half of a bow, three or four arrows, a stone axe with handle and a bone and

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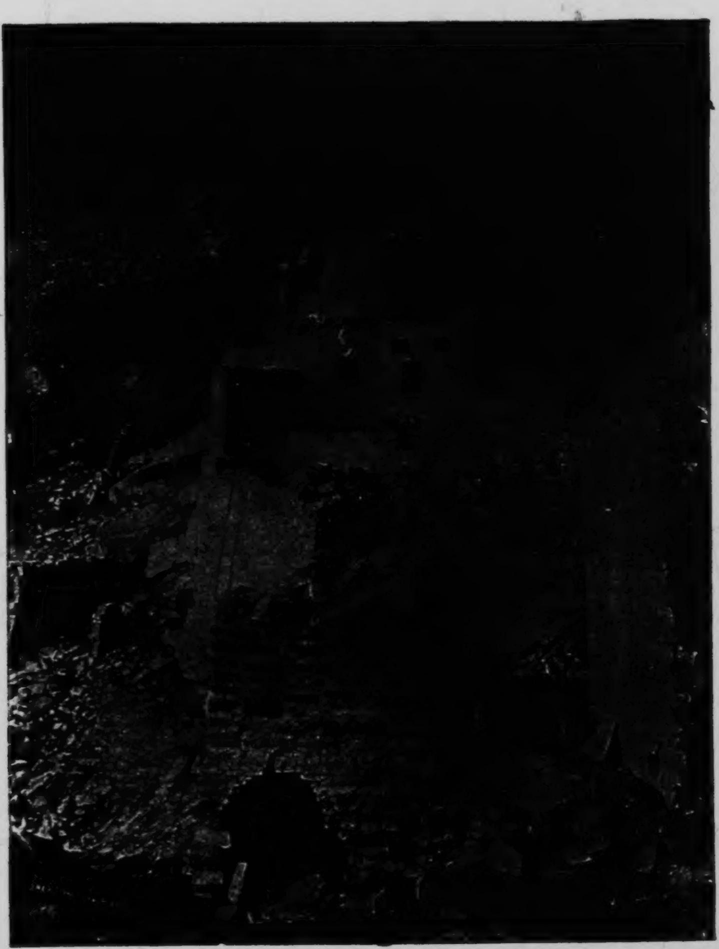
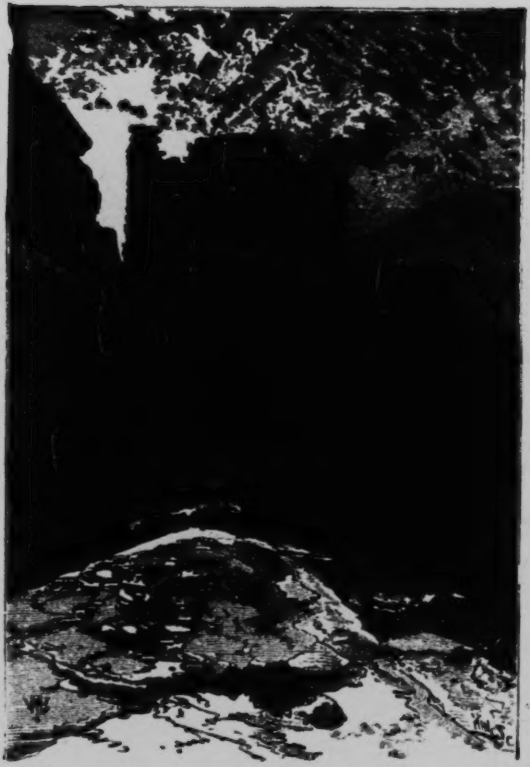
*Similar openings, or air flues, were discovered by Mr. W. H. Holmes, by Mr. Chapin and Mr. Louis W. Guenckel. Mr. Mindeliff also discovered the same in the canon de Chilley, and describes, it in the XVth Annual Report of the Bureau of Ethnology, and gives cuts to illustrate it. It was undoubtedly designed as a flue, or air chamber, and served the double purpose of a ventilator for the room and a draft for carrying the smoke up through the roof,



CLIFF PALACE—SHOWING TERRACES AND DIFFERENT STORIES.



RUINED TOWER ON THE COLORADO RIVER.

knife. It was evident that not the least trace of moisture had been able to reach the rooms under the sheltering rock. And this explains how such things as cotton cloth, wooden implements, string, pieces of hide, and the like, were in a perfect state of preservation. My catalogue includes more than a hundred objects. The most of them were such as were found everywhere in the other cliff dwellings. These would include: pieces of hide, chiefly of deer and mountain sheep, which were used for belts; moccasins, and bags which contained salt; pieces of cloth, well and evenly woven, rather coarse; a great number of wooden and bone implements, and numerous fragments of hide and woven articles. Among the most common articles were pieces of cords, yucca fibre, sandals, pottery, maize, implements of bone and wood and stone implements. Not a trace of metal has been found. The list shows that the former inhabitants of the cliff dwellings were an agricultural people on the level of the Stone Age, who had attained a very high rank in the art of weaving and ornamenting.

On examining the interior of the estufas in Long House, we find even there exactly the same arrangement: a round hollow near the middle, filled with ashes; between the hollow and the wall a low partition; behind the partition the entrance of the above-mentioned passage, which first runs a few metres in a horizontal direction and then straight up to the bottom of the niche, or out into the open air; and, lastly, the six deep, broad niches in the circular wall, separated by the same number of pillars. The estufa itself is enclosed in a quadrangular room; the space between the inner cylindrilical walls and the outer rectilinear ones is filled up to a level with the walls of the estufa, the cylindrilical room being thus embedded in a solid cubical mass of masonry. In all the estufas the same construction is repeated, and the dimensions of the rooms are almost exactly similar.

Below this row of six estufas lies a series of rooms, for the most part buried under heaps of rubble and stones. Further east, on the same ledge as the estufas, lies a block of rooms, the walls of which are still in a good state of preservation, and extend quite up to the roof rock. The innermost of these is more than six metres long, rather narrow and almost dark. On the outer side of this room lie two others which formerly possessed an upper story, and the rafters are still in position, and projecting out a foot or two where they probably afforded the Cliff-Dwellers a hold for the hand in passing the narrow ledge outside the wall. East of these two rooms, lie three more, then comes a long open space; in front of this, along the ledge a long row of rooms reached by climbing up to the upper shelf, a few holes having been hewn by the Cliff-Dwellers in the sandstone to give a foothold and to make the ascent less difficult. Behind the long row of rooms it is possible to follow the free inner part of the cave all the way to the eastern extremity of the ruin.* Outside of this last-mentioned series of rooms lie two estufas, and below these, to the south, a series of rooms on the lower level. At some place further east the cave ends.

The walls of the other rooms in Long House are constructed in the same manner as in the town first described; their thickness is also the same, or an average of 0.3 m. The dimensions of the rooms may be estimated at 2.2x2.5 m., with a height of about 2 m. All the doorways are small, measuring 0.5x0.7 m., and have served as windows as well. They resemble the doorways of the other cliff dwellings. The estufas are of similar form and almost the same size everywhere. They never have an upper story, and they generally lie, when the nature of the ground permits, with the floor sunk lower than that of the adjoining rooms of the ordinary type.

A triangular tower, one wall of which is formed by the cliff, and which still stands to its full height of four stories, is a most interesting feature of the place. One cannot help admiring the skill with which it has been erected. The thickness of the walls is about three metres. The east part of the second story is composed of a niche, the roof of which, is formed of sticks laid across the opening, covered with twigs and a layer of mortar. The floor of the niche is pierced by a narrow passage leading to an estufa hard by. The room in the third story is small, and the upper room is so tiny that it is impossible for a human being to gain entrance.

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* It will be noticed that in Jackson's and Holmes' description of the Cliff House in the Canon de Chelly that a narrow passage runs parallel to the edge of the cliff, but back of the houses, to the two-story group at the end. The whole front of the town is without an aperture save a few small windows, perfectly inaccessible.

I have still to describe one part of Long House, and this not the least remarkable. About fourteen metres above the ruins just described, in the overhanging vault, are two long, narrow, horizontal shelves, separated by the smootn rock. Along the edge of these shelves run low walls, pierced with small loop-holes. The ledge itself was quite narrow, the rock above it so low that one had to creep on hands and knees. The wall along the ledge was only one metre high and fourteen metres long. In the wall we found fifteen small apertures only a few inches wide. These apertures must undoubtedly have been loop-holes for arrows, and were skillfully arranged in all directions, so that the archers were able to command all the approaches to the cliff dwelling, and could discharge a formidable shower of arrows upon an advancing enemy.

A few words in reference to the people who inhabited the Cliff Palace will be appropriate here. It will be understood that no survivor of the Cliff-Dwellers has ever been met, and no tribe has ever been discovered with reliable traditions as to ever having occupied the territory. The only evidence is furnished by the skulls. It may be said here that recently a party has explored the region who claim to have found a very ancient race, different from the ordinary Cliff-Dwellers. Dr. Birdsall also says:

> A theory prevails in Colorado, which the writer was unable to trace to its originator, that three distinct races inhabited the land: the mesa-dwellers, with perfect skulls; the cliff-dwellers, with skulls having a perpendicular occipital flattening, and the valley-dwellers, with skulls having an oblique occipital flattening. The theory is based on the fact that different shaped skulls have been found at these different situations. The number of skulls examined under the writer's observation were not sufficient to establish much; yet he saw skulls removed from the mesa mounds which, contrary to the theory, were both horizontal and oblique flattening. The cliff-house skulls were perpendicularly flattened, and all these flattened skulls were symmetrical. The angle and plane of flattening vary in different skulls, so that it may be readily conceived that in a large number of skulls we might find intermediate grades from the perpendicular to the oblique forms.
>
> The burial mounds on the mesa contain the decayed remains of human skeletons in abundance, and many in a fair state of preservation, yet nothing but the bones remain and pieces of pottery that were buried with the body, these usually in fragments. When the attitude can be determined, it is usually the flexed position, the body having been laid on the side. Skeletons are also found buried among the ledges, where occasionally, under the protection of some large mass of rock, sufficient earth has been retained in which a shallow grave could be excavated. The best preserved human remains are found in the dry material under the cliffs.

This description of the cliff palace is very suggestive of the social progress and the grade of advancement, but does not give much information in reference to the history of the people who occupied the region.

The problem before the archæologist is to take these different ruins, which are scattered along the valley of the San Juan and the Mancos, and to decide which was the earliest, and which the later, and so make out a history from the ruins.

Features are connected with all the ruins of cliff dwellings with the walled-up caved houses, with the ruined pueblos, with the cluster of caches and little houses, and with the pretentious cliff villages, which are called cliff palaces, as well as with the high houses, which make it evident that a long period has elapsed since the people began to make their homes here, for the very rocks in which they had their habitations have become weather worn, and are so wasted away that the front of their houses have disappeared altogether.

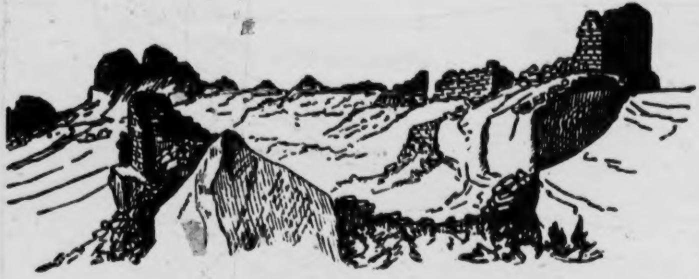
So great has been the erosion that many of the caves are not deep enough to give shelter to a bird or bat. The towers were situated immediately above the caves, and belonged to the community of Cave Dwellers and served as their fortress, council chambers and places of worship. Being on the border of a low mesa country that rises to the north, the strong outside walls were doubtless found necessary to prevent incursions from that direction, while the little community by means of ladders, would be free to pass from dwelling to temple and fortress without danger of molestation. There is every evidence of age, both in the cave dwellings and in the walled enclosures above. The manner of walling up the fronts of the cave dwellings was observed frequently on the Rio Mancos. A large group situated on this stream, about ten miles above its mouth, was subsequently examined. The walls were in many places quite well preserved and new looking, while all about, high and low, were others in all stages of decay. In one place in particular, a picturesque outstanding promontory has been full of dwellings, literally honey-combed by this earth-burrowing race, and as one from below views the rugged, window-pierced crags, he is unconsciously led to wonder if they are not the ruins of some ancient castle, behind whose mouldering walls are hidden the dread secrets of a long forgotten people; but a nearer approach quickly dispels such fancies, for the windows prove to be only doorways to shallow and irregular apartments, hardly sufficiently commodious for a race of pigmies. Neither the outer openings nor the apertures that communicate between the caves are large enough to allow a person of large stature to pass, and one is led to suspect that these nests were not the dwellings proper of these people, but occasional resorts for women and children, and that the somewhat extensive ruins in the valley below were their ordinary dwelling-places. On the brink of the promontory above stands the ruin of a tower, still twelve feet high and similar in most respects to those already described.

Generally, the cliff dwellings are connected, and we can recognize in the ruins, the different apartments used by the inhabitants of the village, and can form a picture of the life that was led, which was very similar to that followed by the Pueblos. But the presence of various structures scattered about among the rocks—towers in one place, caches in another, dwelling apartments in another, shrines in another—indicate a people in the last stages of disintergration, and who were, perhaps just ready to take their flight.

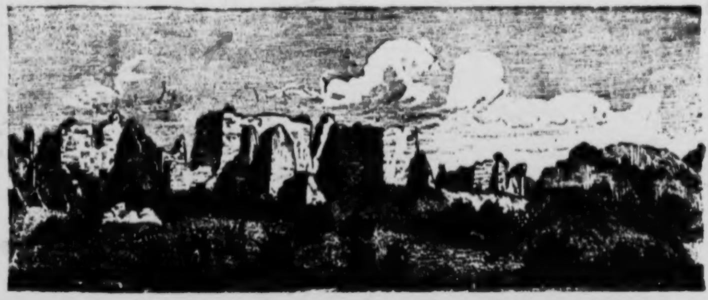
It is a strange fact, however, that during all these dangers there was a constant improvement in the manner of constructing houses and increased provisions for defense. The growth of the Cliff-Dwellers' art and architecture continued throughout the whole period, and the towns and the estufas and the high houses increased notwithstanding the difficulties.

It will be understood that the Cliff-Dwellers were the most ancient occupants of this region and that, notwithstanding the continued presence of the wild tribes who were their constant foes, kept up the customs of their fathers and made a record of themselves and their superior social condition everywhere.

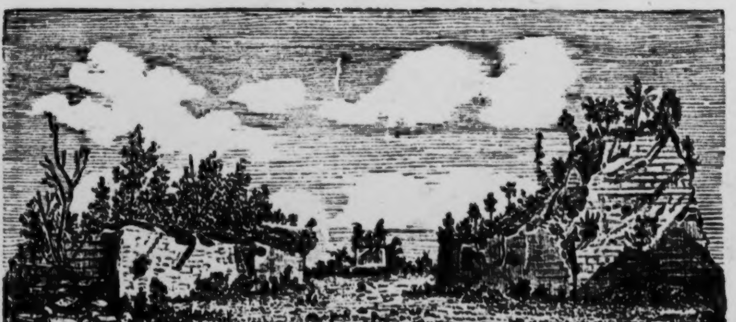
If one were to read the record as given by the ruins, it would be about as follows: First, the occupation of the caves which are now without form and almost obliterated; second, the erection of ancient agricultural settlements in the valleys, the most of which are now in ruins and moss covered and very ancient; third, the erection of pueblos of the honey-comb pattern on the mesas, with towers adjoining; fourth, the selection of sites for cliff dwellings in remote recesses and deep cañons, and the erection of elaborate structures and massive towers and finished estufas and other architectural devices; fifth, the abandonment of the villages in the cañons and the erection of the few scattered houses high up in the sides of the cliffs; sixth, the abandonment of the high houses and the removal of the people to distant places, and followed by the constant occupation of the wild tribes. It is, of course, impossible to fix upon the dates of these different periods; yet the evidence is that many centuries must have elapsed since the first occupation of the region by the mysterious people, and that their stay was a prolonged one, with such intervals between the attacks and incursions of the hostile tribes that permanent houses were erected, and the people were fairly prosperous during the most of the time.



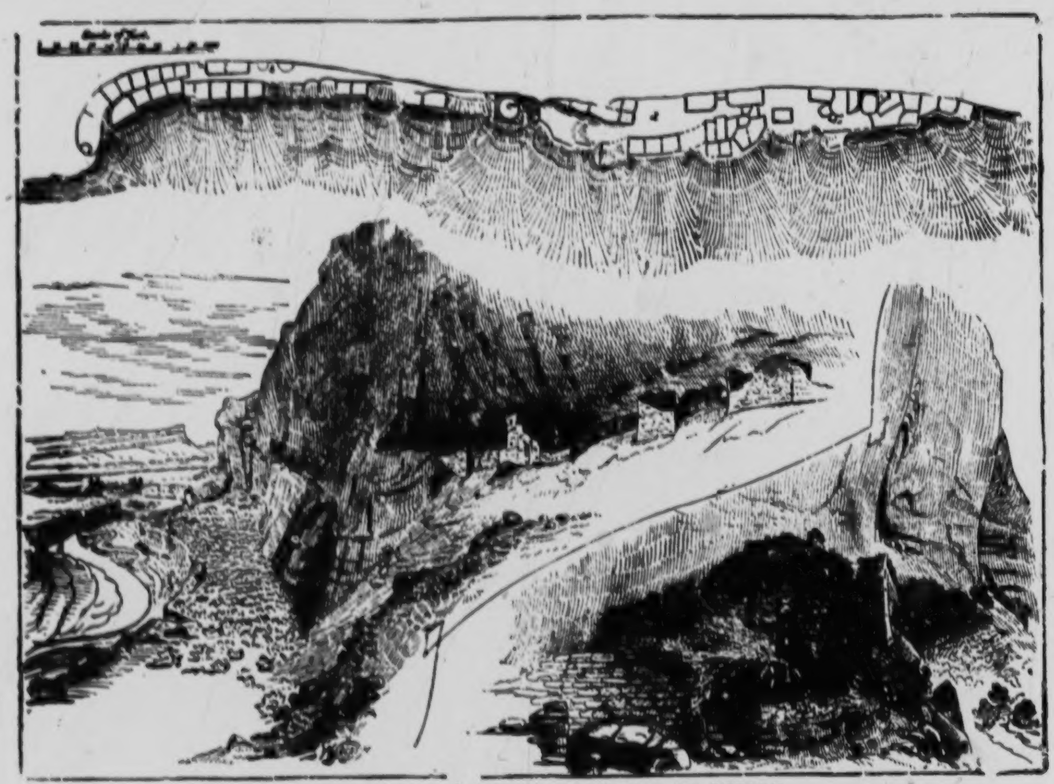
RUINED VILLAGE ON THE SAN JUAN.



CASA GRANDE IN CHIHUAHUA.



ANCIENT RUINS AT CHICKEN ITZA, GUATEMALA.



CLIFF-DWELLERS' VILLAGE IN CANYON DE CHELLY.

# CHAPTER VIII.

## DISTRIBUTION OF CLIFF VILLAGES AND CAVE TOWNS.

The descriptions which have been given of the ruined houses in the valley of the Chaco and of the San Juan, convinces us that at one time there abounded a large population which had been gathered into villages, and that this population was thoroughly organized into a village system which was widely distributed; each village being the home of a clan, which had its own chief, its own medicine men, or priesthood, and its own ancestry; the traditions of the past and the common descent, keeping them together throughout all the changes which occurred.

It is not always the case that villages can be identified as the residence of either family, clan or tribe, yet, as a general principle, we may say that the clan was everywhere the unit, and that the family was so subordinate to the clan that it is not always to be recognized. This constitutes the chief difference between the prehistoric villages and the historic, for in the historic, the family is the unit, and the village is made up of a number of families, who have gathered and made their residence in one locality under the protection of the government, without regard to kinship, nearly every family holding property in severalty. In prehistoric times, villages were made up of those who belonged to the same clan or tribe, and were, in that sense, akin to one another. The land was held in common by either the clan or tribe, the only property that was separate, being that which might be called personal belongings. There was a change in many countries about the time of the opening of history, at which time the tribal life gave way to the civil condition and property began to be held in severalty, or was in the control of the ruling classes.

The prevalence of village life among certain tribes, even to the present day, is very noticeable. There are tribes in India, especially among the mountains where the Dravidic race still continues, in which the clan life has survived and the people live in clan villages, each village ruled by a chief alone. The same is true of the tribes of Africa. Here the villages resemble the conical huts or wigwams, common in America, and so striking is the resemblance, that we might imagine the village of the Zulus to be occupied by North American Indians.

One thing is noticeable, in connection with the early history of this country, and that is that village life was very prevalent here, for the early explorers are constanly describing the villages. Garcillaso de la Vega, speaks of the villages through which

Ferdinan de Soto passed, some of which were surrounded by large fields of corn, but most of them were defended by stockades.

The voyage of Jacques Cartier was made up the St. Lawrence, but the terminating point was at the village of Hochelega, where Montreal now stands. This village was for a time lost to sight and perished from memory. Owing to certain excavations, it was brought to light and identified, and its history rewritten by Sir William Dawson from the monuments and remains, as well as from the records which have been perserved.*

Captain John Smith has described the Powhattan villages on the James river. The explorers, Joliet, Marquette, Hennepin, and La Salle, described Indian villages near Green Bay, Wisconsin; on the Des Moines in Iowa, and on the Illinois river, though none of these were surrounded by any stockade or defense. The Seven Cities of Cibola, which were visited by Coronado in 1536, have been identified as the pueblos of the Zunis, which were nothing but villages of a peculiar kind.

I. The point which most interests us, is that the village system in America was so similiar to that which existed in other countries, especially among the uncivilized tribes. The testimony of all travellers is to the effect that it exists, even in the interior of Russia. Here, old customs perpetuate the village community and land tillage which prevailed in prehistoric times. The land of a Russian village belongs to the people as a whole, and not to individuals. The government is administered by village magistrates, with the aid of a council of elders. They are elected by the people, but represent the patriarchal system so common in ancient times.

Patriarchy was also common in America, though matriarchy was the system which characterized most of the tribes. Among the Cliff-Dwellers and Pueblos, the two systems were in existence and were strangely blended together, the descent being in the line of the mother, and the care of the household and even the ownership of individual property being held by the women; but defense, government. general employment and support of the family being left to the men.

In the regions where there was a struggle for existence and necessity for defense against enemies, or a combination of the people for securing subsistence, the clan life was especially strong, and the village became very prominent. The habitat of the Pueblos and of the Cliff-Dwellers was of this character. Here, the very aridity of the soil, caused by the height of the land and the constant scarcity of rain, rendered the village life almost a necessity. It was a region by itself, isolated, high up, but it is a continent which has a limitless sea of air surrounding it, and is a great distance from any large body of water. It is called the arid region because the climate is very dry and the soil very barren, the rarity of the air producing more evaporation than the streams can counteract. In these respects the plateau differs greatly from the Mississippi Valley, or in fact from any other part of the continent.

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*See "Fossil Men," by Sir William Dawson.

It is worthy of notice, however, that each grand division of the globe has an air continent similar to this. But in none of them has there been a development of human life such as appeared here. It is said that Thibet was the original home of the human race, yet very few prehistoric works have been discovered in Thibet. Central Africa contains peculiar peoples, but the works which are found in that region are comparatively modern. The great plain of Iran is supposed to have been the original home of the civilized races—from this isolated center the Aryan or Indo-European race migrated. Some have supposed that this plateau of the great west was the original home of the civilized races of America, though of this there is much uncertainty. The architecture of the region is certainly unique. There is nothing like it on the face of the earth. The structures which are found here are not only numerous, but there seems to have been a great similarity between them, and so we ascribe a unity to the people who built them.

It certainly seems singular that a region like this should have been so thickly populated and be now filled with so interesting a class of ruins, though once so desolate. All authorities say that the ruins are situated in places where there must have been extensive springs and perhaps perennial streams of water; but the springs are now entirely dry, and the valleys present no streams except as mountain floods occasionally pass through the deep canons. The most interesting part of this region, archæologically considered, is that which lies to the west of the great mountain divide, a region in which the streams all flow toward the Pacific Ocean. These streams have become well known from the presence of many ruins upon their banks, as well as from the strange scenery which is represented.

There is a great contrast between the eastern and western part of the mountains. On the eastern slope are found those many peaks which have become celebrated for their grandeur of scenery—Pike's Peak, Mountain of the Holy Cross, Elk Mountains, Cathedral Rocks, etc. On the western side we come to the wonderful regions of the so-called parks, basins, mesas, table lands, deep canons, and great lake beds—a region which was both volcanic and sedementary in its geological system, its drainage having passed through several changes before it reached the present condition. The deep canons are supposed to be the beds of streams which are as old as the hills, the first drainage having antedated the carboniferous period, but a second drainage passing on to the tertiary period. Here is found the valley of the Colorado River, a river which flows from the very summit of the Rocky Mountains, but which traverses three great States in its course toward the southwest, and finally flows into the Gulf of California. Here also is the Great Salt Lake, a lake which receives the drainage of three other States, but which has no outlet and is dependent upon evaporation for its present level. Here also is the series of great lakes—Pyramid Lake, Lake Tahoe—which have their outlet in the Humboldt River, and which form an interesting feature in the scenery of Nevada. The same region is drained to the north and west by the Snake River, a branch of the Columbia, and by the Yellowstone, one branch of which rises in the famous Yellowstone Park. The region of the Pueblos and Cliff-dwellers is altogether south of Yellowstone Park, but it extends from the mountains of Colorado on over New Mexico, Arizona, part of Utah, and ends on the borders of Mexico and California. This is a remarkable fact. The Colorado River has a branch which enters it near its mouth—the Gila. On this river there are ruins which resemble the famous pueblos of the Animas and the San Juan in Northern Mexico. Not very far from this same river a race of Cliff-dwellers has recently been discovered which resembles the famous Cliff-dwellers of the same rivers. Throughout Arizona there are ancient canals and ancient ruins which remind us of the irrigating contrivances and ancient villages found on the Pecos and in other parts of New Mexico. Taken together, we should say that the discoveries, early and late, had fixed the habitat of this mysterious people in a very singular and mysterious region.

Whether this fact will lead us to connect the history of the people with the ancient race which left their relics in the auriferous gravels of Table Mountain, or with the more modern and more civilized Mexican race, remains to be seen. Still the proximity of the habitat to both localities may prove that here is a connecting link. The very ancient people of California were certainly more advanced than the modern savage Arapahoes, Navajoes, etc., which roam over the same region. Yet is unknown what the descent of the ancient people was.

As to the extent of the population the united testimony proves that it was very great. Maj. Powell, who has long been familiar with it and has often traversed the region, expresses his surprise at seeing nothing for whole days but cliffs everywhere riddled with human habitations, which resembled the cells of a honeycomb more than anything else. Mr. W. H. Holmes, in speaking of the Hovenweep (deserted valley), says: "There is not a living stream throughout this whole region. During the summer months the water occurs in but few places; the rainy season is in winter, the water being then found in the many basins scattered over the mesas. There is scarcely a square mile in the six thousand examined that does not furnish evidence of being the previous habitation of a race totally distinct from the nomadic savages who hold it now, and in many ways superior to them. It seems strange that a country so dry and apparently barren could have supported even a moderate population. It is consequently argued that the climate has become less moist since the ancient population." He says, however, that "there are grass-covered meadows and broad belts of alluvial bottom along the water courses, affording a considerable area of rich tillable land. The rainfall varies in different parts. In Colorado it is said to be less than a foot and a half. It has been conjectured that the destruction of the forests by the Cliff-dwellers themselves may account for the diminution of the rainfall and for the aridity of the region." The scenery here is grand, but nevertheless very desolate. Its resources are deeply hidden, the distances are great and the region difficult to traverse. Here, separate from all others, and lonely in the isolation, there grew up a peculiar population which reached a high grade of civilization. It is the home of the semi-civilized race, while the Mississippi Valley was the home of the uncivilized.

The great plateau presents an interesting class of prehistoric structures, as interesting as any found on the face of the globe. The age of these structures is unknown The probability is that they were not all of the same age. That some of them are modern no one will deny, but that some of them were ancient we think is shown by the facts. One argument for their great antiquity is drawn from the change which has come over the climate. Otherwise there is a mystery about the sustenance of so numerous a population. Mr. Holmes says one may travel for miles in the parched bed of a stream and not find a drop of water anywhere. In the greater part of the region there is so little moisture that the vegetation is very sparse, yet there is bountiful evidence that at one time it supported a numerous population. Labyrinthine canons ramify the plateaux in every direction with an interminable series of deep and desolate gorges and wide barren valleys.

II. We turn to the description of the different classes of structures which were found in the great plateau. Here we draw from an article which has recently been published in *The Forum* from the pen of Maj. J. W. Powell:- "The greatest table land of the arid region is the Colorado plateau, lying to the south of the most stupendous gorge known on the face of the globe, the Grand canon. The summit of this plateau is crowned with many extinct volcanoes, and black and angry looking cinder cones are scattered in groups or stand in lines throughout the region. The general surface is from seven thousand to eight thousand feet above the level of the sea, and is covered with pine forests, but nestling in the sombre woods sunny valleys are found, and above the valleys rise the black cones of lava."

1. Here we find one class of ruins. Sometimes the amphitheatre of a dead volcano is the site of an ancient pueblo. In the ragged cliffs ugly irregular caves are found, and these have been walled with fragments of cinder, so that above the cliffs are clustered curious chambers made by fires long extinct. In these ruins no strange arts are found, nor do they bear evidence of great antiquity. We know that a tribe now living in Cataract canon claims to have formerly occupied one of the crater villages. There is a cone, but an hour's ride from the foot of San Francisco mountain, which is composed of fine volcanic dust, scoria and large blocks of ejected matter. On this the ruins of a curious little pueblo were discovered. On the top there is a small plaza walled with cinder; about this plaza chambers have been built. Shafts were sunk from eight to ten feet in depth, two and a half feet to three and a half feet to cross section. The chambers are below the surface. The ground is undermined, and an irregular room from eight to ten feet in diameter, and five or six feet in heighth is found. Around this central room two or three smaller rooms are dug out of the ashy rock. About one hundred such under ground dwellings have been discovered, in various conditions of ruin. They have all been carefully examined, and the stone knives, hammers, mortars, tools of bone and horn, fragments of baskets, pieces of coarse cloth, all prove that these people had arts quite like those of the Puebloes and Cliff dwellers. Their pottery was the same; they raised corn, ensnared rabbits, hunted antelopes, deer and elks in the forests and plains, and all show that they had the wel-lknown culture of the general region.

2. West of Santa Fe, in New Mexico, and beyond the Rio Grande there is an irregular group of mountains and high plateaux known as the Tewan Mountains. Here in some ancient times a succession of volcanoes burst out. Sometimes they poured forth molten lava, but oftener threw high into the air enormous quantities of cinder and ashes. These fell and buried the sheets of lava, and were themselves covered with molten rock. The rivers that head on these mountains and run down into the Rio Grande, have cut down through the alternating layers of lava and tufa many deep and winding picturesque canons, and here we have another class of dwellings. The tufa is sufficiently hard to stand in vertical cliffs, and yet so soft that it can be worked with great ease by the use of stone tools. There are many miles of these tufa cliffs, and into them thousands of chambers have been hollowed. Such a chamber is entered by a narrow door-way three or four feet high. Within a chamber is found ten or twelve feet square, four to six feet in height, and more less irregular in form. About this two or more smaller chambers are found, t

whole forming a suite of apartments. A few feet further along on the face of the cliffs another such suite may be found, sometimes two or more suites connected by interior passages. The chambers are often irregularly situated, one above another, and the face of a cliff presents many such openings. Here and there are rude stairways hewn in the soft rock, by which the dwellings are reached with more or less difficulty. These are the "cavate" dwellings of the Tewan mountains. Though at first supposed to be very ancient, research proves that many of them are quite modern, having been occupied since the Spanish settlement by a people owing sheep, goats, asses and horses. The more ancient give evidence of having been occupied by people having arts identical with other pueblo tribes.

3. On the long narrow plateaux that stand between the deep canons running down into the Rio Grande there are many puebloes in ruins, which were made of blocks of the same tufa, which is easily worked with stone tools. The blocks vary from ten to twelve inches in length, are usually eight inches in breadth, and from four to six inches in thickness. They were laid in clay mortar. Each communal dwelling or pueblo was a cluster of small irregular rooms covered with poles, brush and earth. Various Tewan tribes claim these as their original homes.

4. In the southwest portions of the United States, conditions of aridity prevailed. The forests are few and found only on great altitudes, on mountains and plateaux where deep snow appears, and frosts often blasts the vegetation in summer. Such forest-clad lands were not attractive homes, and the tribes lived in the plains and valleys below, while the highlands were the hunting grounds. The arid lands below were often naked of vegetation, but in the ledges and cliffs that stand athwart the lands and in the canon walls that enclose the streams were everywhere quarries of loose rock, lying in blocks ready for the builder's hand. Hence, these people learned to build their dwellings of stone. They had large communal houses, even larger than the structures of wood made by the Mound-builders. Many of these stone puebloes are still occupied.

5. There are ruins scattered over a region embracing a little of California and Nevada, and far southward. These ruins are thousands and tens of thousands in number. Many of these were built thousands of years ago, but they were built by the ancestors of existing tribes, or their congeners. A careful study of these ruins for the last twenty years demonstrates that the pueblo culture began with rude structure of stone and brush, until at the time of the exploration of the country by the Spaniards, in 1540, it had reached its highest phase. The Zuni has been built since and it is the largest and best village ever established within the territory of the United States without the aid of ideas derived from civilized men. Not all the valleys of the

arid region are supplied with the loose stone, and so a few tribes of the region learned to construct their homes of other material. They built them of grout adobe in this manner: For the construction of a wall they drove stakes into the ground in two parallel lines, two or three feet apart. They then wove willows, or twigs, or boughs through the stakes of each line, so as to make a wicker work box, and between the sides of this box, or between the walls, they place a stiff mixture of clay and gravel. In this way they built many houses, sometimes great assembly houses, similar in purpose to those used by the Mound-builders. The Casa Grande of Arizona is one of these. The people were agriculturists. They cultivated the soil by the aid of irrigation, and constructed some interesting hydraulic works. The most important of these are found in the valley of the Gila. These remarks by Major Powell are very interesting. They are confirmed by other explorers. We here give cuts which are taken from articles furnished by Mr. F. W. Cushing and others.

III. We now turn to a description of the cliff-dwellings, sometimes called cave-dwellings and sometimes cliff-dwellings.

1. Let us consider the caves as such. It is noticeable that while there are habitations resembling the cave-dwellings scattered all over the continent, yet the cliff-dwellings themselves are confined to one particular or, at most, to two definite localities, the majority of them being found in the valley of one particular stream or river, namely, the Colorado and its tributaries—the Rio Doloroso, the San Juan, the Rio Mancos, and the LaPlata. This is a region which is celebrated for its deep canons and its precipitous cliffs and its desolate scenery. It is just such a region as we could expect to find abounding with caves—the model home of the Cave-dwellers. There are cave-dwellings in America as there are in Europe, but these generally belong to the later part of the paleolithic age, cr to the earlier part of the neolithic age. There is, however, a great difference between them and the cliff-dwellings about which we are speaking. In fact, all the difference that would exist between the earlier part of the stone age and the later part. There is a whole age between the two. In Europe we have the caves which contain the bones of extinct animals—the mastodon, the cave bear and the rhinocerous. After them came the reindeer period. This was followed by the kitchen middens; after the kitchen middens came the barrows, after the barrows came the Lake-dwellers, and after the Lake-dwellers came the rude stone monuments.

Originally the cave-dwellings belonged to a period which antedated the kitchen middens, and so would be classed with the paleolithic age; but there are so many caves in this country which were manifestly neolithic that we must place them in that age, but assign them to different periods in that age.

There are cave-dwellings in many parts of America, some being found as far north as Alaska, where they are associated with shell heaps; others in the Mississippi valley, where they are closely connected with the mounds; others in the midst of the canons of Colorado and Arizona, where they are associated with structures resembling the pueblos; others in the central regions on the coasts of Lake Managua, in Nicaragua, and still others in the valley of the Amazon in South America. These last have, however, been classed with the paleolithic age, as it is claimed that animal bones and other remains of the quaternary period are found in them. The caves are also scattered over various parts of Europe, some of them being classed with the paleolithic and some with the neolithic age. In a general way we should say that caves were the abodes of man during the latter part of the paleolithic and the early part of the neolithic age, though it is evident that some of them were occupied through the whole prehistoric period and even far down into the historic period.

Caves are not to be classed with monuments, yet as they have been associated with various kinds of monuments and have produced all kinds of relics, we have to give to them a broad space in the horizon, classing some of them with the old stone age, others with the new stone age, and even placing some in the bronze and the iron age. It is worthy of notice that the division of the paleolithic age is based altogether on the contents of the caves and that the names are derived from the caves, the Chelleen, the Mousterien, the Solutrien, and the Madalenien caves all having yielded relics which have been divided in this way and which have given rise to the subdivisions of the paleolithic age. As to the place which we are to assign the cave-dwellers of America in the order of succession, this for the present is uncertain, as each author is influenced by his own discoveries, and no general system has been adopted. We give here the names of a few of the archæologists who have treated of the cave-dwellers: First, we would mention Mr. William H. Dall.[*] He has described the caves of Alaska; he says that there were here three periods, first, that of the so-called littoral people, a people which is to be classed with the paleolithic age; second, that of the cave-dwellers, a people who were in the neolithic state, and, third, that of the hut-makers, a people who might have left monuments. Next to him is Prof. F. W. Putnam, who has described the caves in Tennessee. These contained the tokens of a neolithic character, though it is uncertain whether they preceded the mounds or were contemporaneous with them.

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[*] Wm. H. Dall, "Remains of Later Prehistoric Man from the Caves of the Catherina Archipelago, Alaska Territory," Smith, con., 1878. Prof. M. C. Read on Rock Shelter in Ohio, Amer. Antiquarian, March, 1880. Hald man, Rock Retreat near Chickies, Penn. Whittlesey on Rock Shelter at Elyria, Ohio. Putnam on Salt Cave and Short's Cave in Tennessee.

Dr. Earl Flint is another author who has written upon the caves. He claims that there are caves in Nicaragua which were very ancient, how ancient he hardly undertakes to tell. Dr. Flint's discoveries have not been confirmed. It does not seem likely that inscriptions of the kind described by him could have been wrought by a people preceding the neolithic age, and therefore we should be inclined to place this cave in that age. This leaves then only one single locality for the paleolithic cave-dweller, namely, that spoken of by Prof. Lund as found in Brazil, a locality which M. Nadaillac has described at some length.

We give cuts which will illustrate the point. In one figure we have a cave of the paleolithic age. It was discovered by Dr. Goldfusse in Isio. It proved that man occupied caves when bears, hyenas and other extinct animals were common in Europe. The next cut shows a cave of the neolithic type. It is the cave in Alaska described by Mr. William H. Dall.

2. Next to these are the cliff-dwellings of Arizona and Colorado. The most of these are known to be so much more advanced than ordinary caves as to be classed with the monuments of a higher grade. Mr. W. H. Holmes speaks of caves in Colorado which, he thinks, were very ancient, so ancient, in fact, that the rock which formed their openings has worn entirely away, leaving them now as mere shelters or nooks in the cliff. The cliff-dwellers, of course, are to be placed with the neolithic age, and at an advanced part of that age, probably the same part which was occupied by the Pueblos of the same region.

These have been described by Mr. Holmes. The watch towers above show that they were occupied by a people of an advanced class. See Plate III. He thinks that some of these caves were very ancient, as the mouths or openings have worn away since they were occupied, leaving the former habitations without walls to protect them.

This is an important point, and yet the presence of the estufas or towers above the cliffs give the impression that they were not so very ancient. It is possible that the people dwelt in these enclosures on the summit, using the tower both for an outlook and an estufa, but that in times of danger they fled from their houses and went down the cliffs into the caves, enduring exposure for the time for the sake of protection. This is an interesting locality. It is situated on the San Juan River. The cliffs here are only thirty-five to forty feet in height. The ruins are three in number, one rectangular and two circular. Each one of them is placed over a different group of cave-dwellings, ose to the edge of the mesa. About one hundred and fifty yard s to the southwest of this ruin are the remains of another similar structure. It is built, however, on a much grander scale; the walls are twenty-six inches thick, and indicate a diameter of about one hundred and forty feet. The first impression was that it was designed for a corral, and used for the protection of herds of domestic animals. This would prove that it was a modern work and not an ancient one. Mr. Holmes says that they both belong to the community of Cave-dwellers and served as their fortresses, council chambers and places of worship. These would seem to be reasonable and natural inferences. Being on the border of a low mesa country that rises toward the north, strong outside walls were found necessary to prevent incursions from that quarter, while the little community, by means of ladders, would pass from dwelling to temple and fortress without danger of molestation. See Plate IV. Mr. Holmes describes another cave-dwelling situated on the Rio Mancos canon. An outstanding promontory was honeycombed by this earth-burrowing race. Window-pierced crags were visible, which contained towers upon the very summits. Other openings were walled, leaving windows or doors into the side of the precipice, the apertures being scarcely large enough to allow a person of large stature to pass. He says that one is led to suspect that these nests were not the dwellings proper of these people, but occasional resorts for women and children. The somewhat extensive ruins in the valley below were their ordinary dwelling places. He speaks of the round towers, and says they are very numerous in the valley of the Mancos. He visited and measured seven in fifteen miles along the course of this stream. In dimensions, they range from ten to sixteen feet in diameter and two feet in thickness. They are, in almost every case, connected with other structures, mostly rectangular in form. In this respect they resemble the square and circle which are found in the Mound-builders' works in the Ohio valley. The Rio Mancos canon is 30 miles in length, and ranges from 1,000 to 2,000 feet in depth. It seems to have been a favorite resort of the cliff-building people, and traces of their

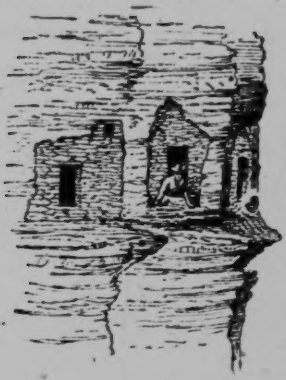


Fig. 3.

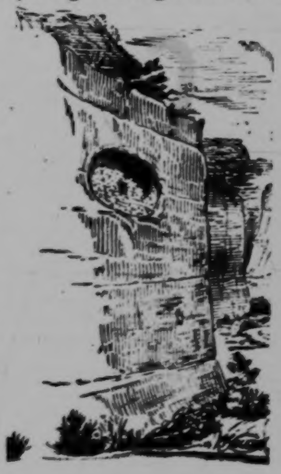


Fig. 4.

industry may be found everywhere along the bottoms, on the cliffs and on the high dry table lands above. He refers to walling up the cave front, and gives several illustrations. A sketch of one on the Rio Mancos is given in the cut, Fig. 3. The group occurred in the cliff, about thirty feet from the base. The three doorways opened into as many small apartments, but these were connected with each other by very small passage-ways. He speaks also of a cozy little dwelling which was hidden away in a weather-worn cavity in a massive crag. See Fig. 5. This was situated not far from a great tower which he discovered on an isolated spot in the midst of the valley and near the trail. A rude little fire place was observed in connection with the cliff-house on the opposite side of the canon. See Fig. 6. It is the only example discovered. There seem to be no traces whatever of fire-places, ovens, furnaces, or chimneys about any of the ruins except this. The walled-up caves on the Rio Mancos canon may be compared to the cave-dwellings and towers on the Rio San Juan. In this case the towers are below the cliff—in the valley instead of on the summit. We give two other specimens of these cliff-houses. These were also found on the Rio Mancos. They have been described by Mr. W. H. Jackson. See Figs. 4 and 7.

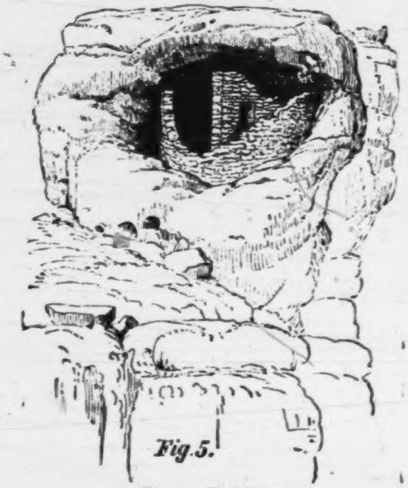


Fig. 5.

*Fig. 5.—Cliff Houses.*

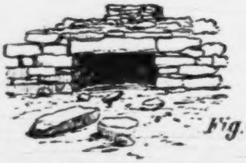


Fig. 6.

The round towers are worthy of notice. Some of these are isolated, but some of them are connected with rectangular buildings. We give two cuts to illustrate these. Fig. 9 gives a plan of the double tower near the mouth of the Mancos; Fig. 10 occurs about eight miles above the foot of the canon; it is nine feet in diameter on the inside and about sixteen feet high. There are three rectangular apartments attached. This cut illustrates one method of defense and shows the uses which were made of some of the towers. There were no windows or openings within reach of the ground, but being built in connection with dwellings they could be reached from within these, and be secure from without. A large circular tower is described by Mr. Holmes. It was situated in the canon of the Mancos on a narrow strip of alluvial bottom. The diameter of the outer wall is forty-three feet, that of the inner twenty-five feet. The outside courses have been dressed to the curve, and the implements used must have been of stone. The space between the walls was divided into cells. The main walls are twenty-one inches in thickness, but the partition walls are somewhat lighter. The walls were twelve feet high when discovered. The circle seems to have been divided into ten cells. There were no indications of windows or doors in the outer walls. Entrance was made by means of ladders through high windows or by way of the roof. There were openings between the central enclosure and the cells, but these were high up. The one that remains entire is six feet from the ground, and measures two feet in width by three in height. The lintel is a single slab of sandstone, That this ruin is quite ancient is attested by the advanced stage of decay. There were no buildings in connection with the ruin, but on the point of a low rock or promontory that extends down from the mesa to within a few rods of the circular rnin, are some masses of decaying wall and a large circular depression. This tower was probably the estufa for the houses which were situated in the sides of the cliff to be described.

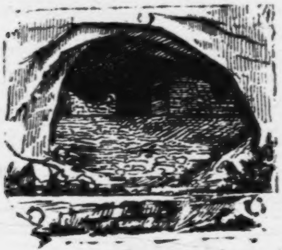


*Fig. 7.*

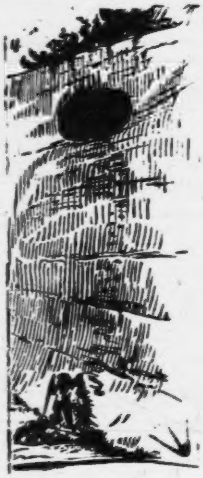


*Fig. 8.*

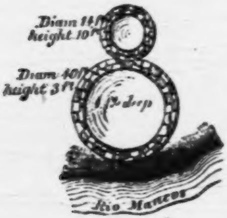


*Fig. 9.*

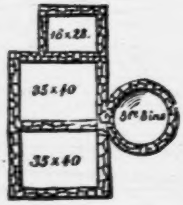


*Fig. 10.*

The position of this ruin is one of almost unparalleled security. The almost vertical cliff descends abruptly from the front wall, and the immense arched roof of solid stone projects forward fifteen or twenty feet beyond the house. Running water was found within a few yards of the groups of houses just described. There were evidences of fire, the walls and ceilings of one of the rooms being blackened with smoke. The small rooms were used for storage, and a qnantity of beans was taken from one and grains of corn from another.

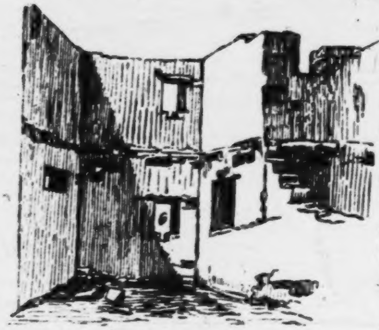


*Fig. 11.—Two-Story Cliff House.*

Another group of cliff-dwellings was situated about a mile farther up the canon. It was exceedingly difficult of access, being situated in the cliffs about seven hundred feet above the river. Fig. 14. It is a two-story building. The one remarkable feature of the house is the consummate skill with which the foundations are laid and cemented to the sloping and overhanging faces of the ledge. Mr. Holmes says that although the building seems complete, and had windows and doors conveniently and carefully arranged, the plastering of the interior is almost untouched, and there is scarcely any trace of the presence of man. The plaster may have been applied only shortly before the final desertion. Mr. Jackson says: Among all dwellers in mud-plastered houses it is the practice to freshen up their habitations by repeated applications of clay, moistened to the proper consistency, and spread with the hands. Every such application makes a building

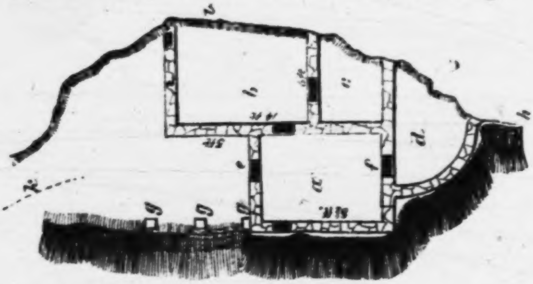


*Fig. 12.—Ground Plan.*

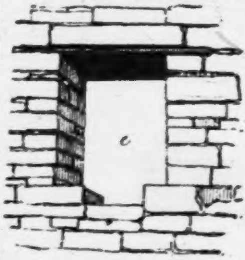


*Fig. 13.—Doorway.*

appear perfectly new, and many of the best sheltered cave houses have this appearance, as though they were but just vacated. The plaster does not differ greatly from common mortar. It is lightly spread over the walls, probably with the hands, and in color imitates very closely the hues of the surrounding cliffs, a pleasing variety of red and yellow grays. Whether this was intended to add to the beauty of the dwelling or to its security by increasing its resemblance to the surrounding cliffs, I shall not attempt to determine."

The extraordinary situation of these houses is shown in the cuts on pages 82 and 93, but the arrangement of the rooms, the appearance of the plaster, the shape and construction of the doors and the position of the semicircular tank outside of the house, are shown in the cuts on the page opposite, Fig 12; A, B and C representing the ground floor, and D the cistern.

Another group of rock shelters is described by Mr. Jackson:

> They were situated on a ledge about two hundred feet long and six feet deep, but resemble cubby holes. At first they seemed as if they might be caches, but the evidences of fire showed that they had been quite constantly occupied. There was a row of these rock shelters, doors through the dividing walls affording a passage, the whole length of the ledge. Another group of three small houses, each about five feet wide and ten feet long, with doors through the end walls, was seen situated about sixty feet above the trail. Still another group was found on the Rio San Juan, consisting of an open plaza, with three rows of apartments surrounding it. These are propably parts of disintergated villages, the towers and estufas being in the valley below.

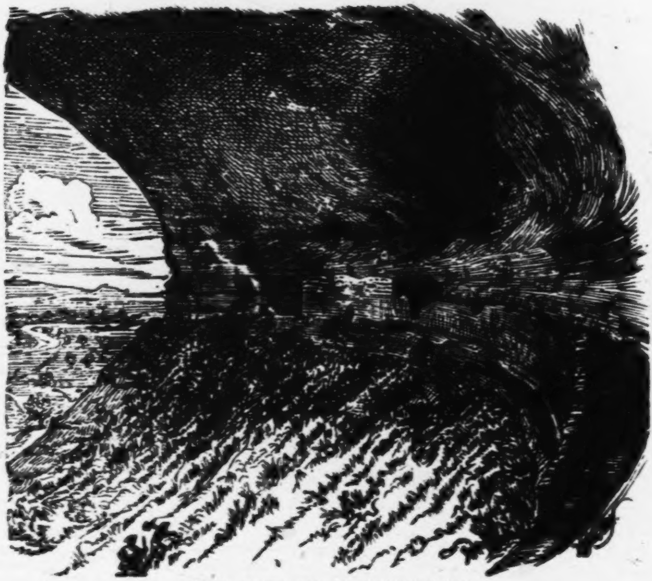
Mr. Jackson has also described what he calls the Echo Cave. His description is as follows:

> It is situated twelve miles below the Montezuma. The bluff here is about two hundred feet in height; the depth of the cave was one hundred feet. The houses occupy the eastern half of the cave. The first building was a small structure, sixteen feet long, three to four feet wide. Next came an open space eleven feet long and nine feet deep, probably a work-shop. Four holes were drilled into the smooth rock, six feet apart, probably designed to hold the posts for a loom, showing that the people were familiar with the art of weaving. There were also grooves worn into the rock where the people had polished their stone implements. The main building comes next, forty-eight feet long, twelve feet high, ten feet wide, divided into three rooms, with lower and upper story, each story being five feet high. There were holes for the beams in the walls, and window-like apertures between the rooms, affording communication to each room of the second story. There was also one window in each lower room, about twelve inches square, looking out toward the open country; and in the upper rooms several small apertures, of not more than three inches wide, were pierced through the walls, hardly more than peep holes [loop holes]. The walls of a large building continued in an unbroken line 130 feet further, with an average height of eight feet. The space was divided into eleven apartments, with communicating apertures between them. The first room was 9½ feet wide, the others dwindled gradually to only four feet. The rooms were of unequal length, the following being the inside measurements: 12½ feet, 9½ feet, 8 feet, 7½ feet, 9 feet, 10 feet, 8 feet, 7 feet, 7 feet, 8 feet, 31 feet. The ledge runs then 50 feet further, gradually narrowing, while another wall occurs crossing it, after which it soon merges into the smooth wall of the cave. The first of the rooms had an aperture large enough to crawl through, leading outward; all the others, of which there were about two to

each room, were mere peep holes* [loop holes] about three inches in diameter and generally pierced through the wall at a downward angle.

In the central room of the main building, we found a circular basin-like depression, thirty inches across and ten inches deep, that had served as a fire-place, being still filled with the ashes and cinders of aboriginal fires. The surrounding walls were blackened with smoke and soot. This room was undoubtedly the kitchen of the house; some of the small rooms seem to have been used for the same purpose,† the fires having been made in the corners against the wall, the smoke escaping overhead.

The masonry displayed in the construction of the walls is very creditable. A symmetrical curve is preserved throughout the whole line, and every portion perfectly plumb; the subdivisions are at right angles to the front, the stones are roughly broken to a uniform size. More attention seems to have been paid to securing a smooth appearance upon the exterior than the interior surfaces, the clay cement being spread to a perfectly plain surface, something like a modern stucco finish. On the inner walls of some of the subdivisions, the impression of the hands, and even the delicate lines of the thumbs and fingers of the builders, were plainly retained; in one or two cases, a perfect mould of the whole inner surface of the hand was imprinted; they were considerably smaller than our hands and were probably those of women or children. In the mortar between the stones, several corn cobs were found imbedded, and in other places, the whole ear of corn had been impressed in the clay. The ears were quite small and



ECHO CAVE ON THE SAN JUAN.

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* These peep holes or loop holes in the walls show that Echo Cave was used as a fortress, as well as a village residence, the so-called loop-hole forts and the living rooms being here combined.

† The fire-places in these rooms show that the people were accustomed to keep the fires burning through the cold winter months, the same as did the inhabitants of Cliff Palace and other places.

none more than five inches long. The whole appearance of the place and its surroundings indicates that the family, or little community, who inhabited it were in good circumstances and the lords of the surrounding country. Looking out from one of their houses, with a great dome of solid rock overhead, that echoed and re echoed every word uttered with marvellous distinctness, and below them a steep descent of 100 feet to the broad, fertile valley of the Rio San Juan, covered with waving fields of maize and scattered groves of majestic cottonwoods, these old people, whom even the imagination can hardly clothe with reality, must have felt a sense of security that even the incursions of their barbarian foes could hardly have disturbed.

Five miles above the Canyon Bonito, Chelly expands into a wide valley that extends with only slight interruptions, to the foot of the Canyon de Chelly, at the northern end of the Tunicha Mountains. It is bordered by low but abrupt sandstone bluffs, which have been broken into isolated monuments in some places, that stand like huge sentinels upon either hand, as if to warn the traveller from the desolation surrounding him. Although the bluffs contain numerous great circular caves, favorite building places of the ancient builders, we find only two or three ruins of that kind, and these only in the lower end of the valley, the last we noticed being about eight miles above the Canyon Bonito. This was the largest and most important one in this vicinity, occupying a large cave very similar to the one of the San Juan, divided into twelve or fifteen rooms, with a large corral or court, and an elevated bench on one side, with a low wall running around its front edge. This had been occupied by the Navajoes for corraling their sheep.

The most interesting villages are those situated in the Cañon de Chelly. Mr. Jackson speaks of one particular village and has given a plate illustrating the situation of the village and of the houses belonging to it.* He says:

This cave-town occurs in a great bend of the encircling line of bluffs, and is perched upon the recess bench, about seventy feet above the valley. It is overhung by a solid wall of massive sandstone extending up over 200 feet higher. The left side of the bench supporting the building sweeps backs in a sharp curve, about eighty feet under the bluff, and then gradually comes to the front again. The total length of the town is 545 feet, the width is in no place greater than forty feet. There are somewhere in the neighborhood of seventy-five rooms upon the ground plan. Midway in the town is a circular room, which was probably intended for an estufa. Starting from this estufa is a narrow passage, running back of the line of houses on the left to the two-story group, where it ends abruptly; further access being had through the lower rooms, or over the roofs. At the extreme left hand, a still higher ledge occurs, where there was a space reserved as an out-of-door working room. All the buildings are of one story, with the exception of the group A, the residence, probably, of the chief. The rooms back of it were the store-rooms, where the corn and squashes were put away. Near the store-rooms are two half-round enclosures of stone-work, remains of reservoirs or springs. The front line of the wall of this end of the town is built upon the slope of the rocks, with the interior of the apartments filled up with earth, so as to make their floors level, bringing them a little below the passage-way. The whole front of this portion of the town is without an aperture, save some small windows, and is perfectly inaccessible. Admittance was gained, near the circular building in the centre, by ladders.

Going to the right from the estufa, you have to climb up about eight feet to a narrow ledge. Here the buildings are built irregularly over the uneven surface, each house conforming to the irregularities, but presented the general arrangement of clusters about central courts. They may have served as corrals.[*] Some of the rooms were quite large, from fifteen to twenty-five feet in length. The very small rooms surrounding them were probably for storage, and in some cases answer the purpose of fire-places for baking pottery. All the doorways and windows open from within the courts, and were unusually large. The walls are from six inches to a foot in thickness. The stones of which the walls are built are long, thin slabs laid in an abundance of adobe mortar. Most of the rooms, inside and outside, have been smoothly plastered with clay. At the foot of the bluff, on a low bench about ten feet above the level of the valley, are the indications of old buildings and burial places. Chipped flint works, arrow-points, perforators, knives, and domestic utensils were found, also seven large earthen pots of indented ware, and a handsome little jug or vase.

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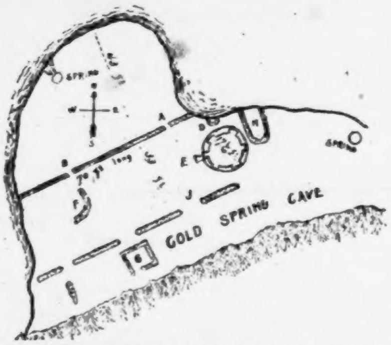
*See Hayden's Report United States Survey (1876), page 422

On the McElmo and on the Montezuma Cañon, north and west of the Bonito, a large number of small cliff-villages have been discovered. Several of these have been discovered by Mr. Lewis W. Gunckel and Mr. Warren K. Moorehead. They are situated in cañons called Cold Spring, Eagles Nest, Monarch Cavern, Cottonwood Gulch, Giants' Cave, Hawks' Nest Cave, and Butlers Wash. In each of these, there is a wall running near the edge of the cliff, with an enclosure back of it, containing a spring of water, an open area and an estufa at the end of the ledge, showing that it was a cliff-village.



CLIFF VILLAGE IN COLD SPRING CAVE.

Other cliff-dwellings on the Rio de Chelly[†] have been described elsewhere in this volume. The most notable village is the one represented in the plate[‡] and called Casa Blanca, or White House.[§] This is the ruin seen by Lieutenant Simpson in 1849. The following in the description:

> In its present condition it consists of two distinct parts, the lower part comprising a large cluster of rooms on the bottom land against the vertical cliff, and the upper part, which is much smaller, occupying a cave directly over it, and being separated from it by a distance of only thirty-five feet of vertical cliff. There is evidence, however, that some of the houses in the lower pueblo were four stories high and that the strnctures were practically continuous. The lower ruin covers an area of about 150 by 50 feet. Within this area there are remains of forty-five rooms on the ground and a circular kiva. On the east side the walls are still standing to the height of twelve or fourteen feet. It is probable that the lower ruin comprised about

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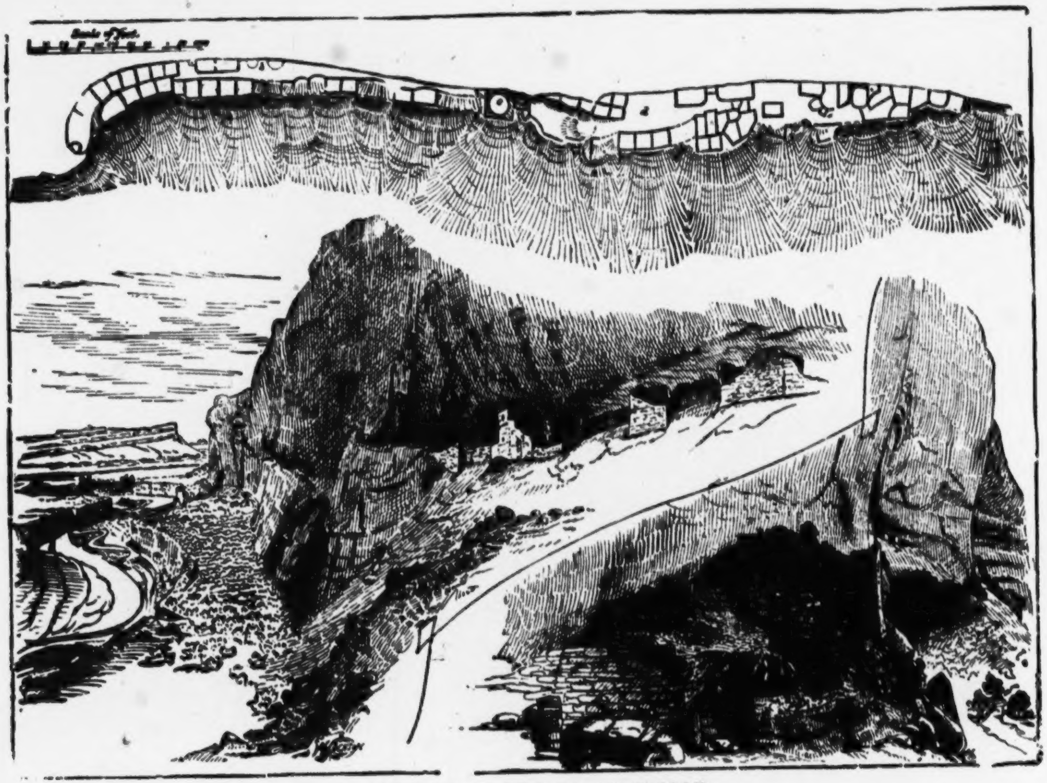
[*] Some of these corrals disclosed a solidly packed bed of old manure, very nearly resolved into dust, through which were scattered twigs of willow and fragments of pottery. This shows that the cliff-dwelling was occupied by the Navajoes, and that their flocks of sheep were kept in the apartments.

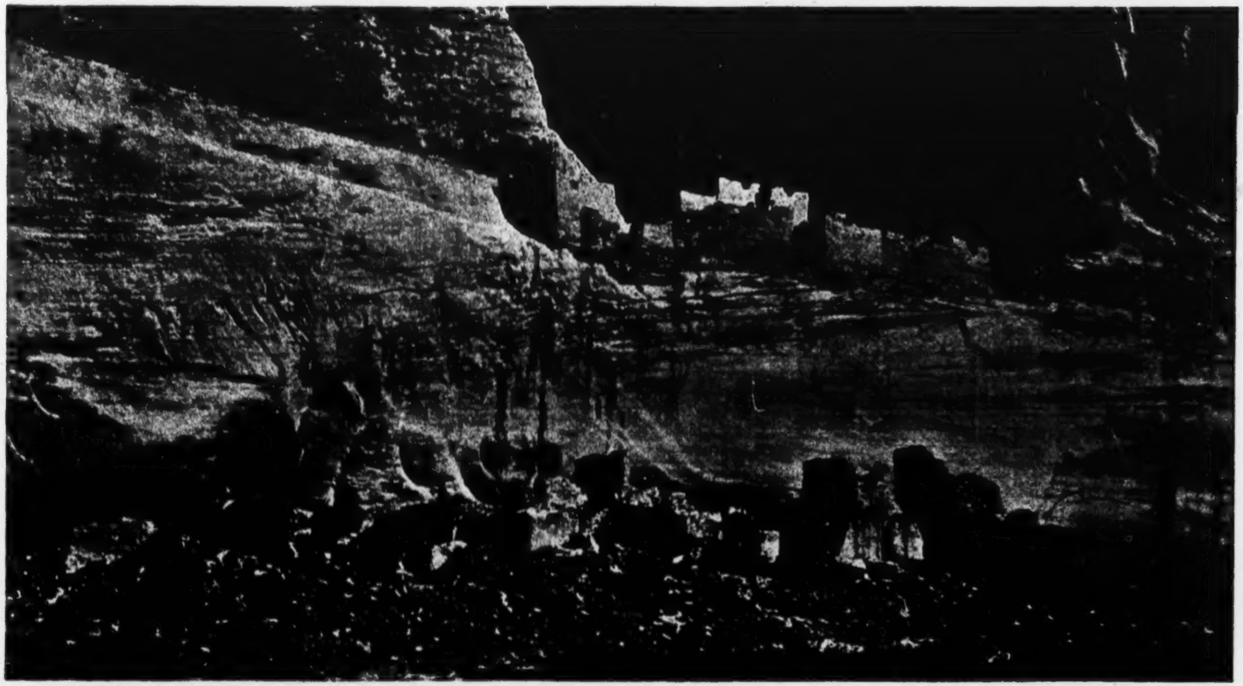
[†] See pages 204, 240, 323 and 324.

[‡] See page 228, and compare with cliff-house on page 205.

[§] The cut on page 284 represents the ruins called Mummy Cave, instead of White House. The wrong title is given to the cut.


Scale of Feet.

CLIFF TOWN ON THE RIO DE CHELLY.



CASA BLANCA—A CLIFF TOWN IN CANYON DE CHELLY.

sixty rooms, which, with the ruins in the cave, would make a total of eighty. The principal room in the upper ruin is situated nearly in the centre of the cave. The walls are two feet thick, constructed of stone, twelve feet high in front, seven feet high at the sides. The exterior was finished with a coat of white-wash, with a decorative band of yellow. Two rooms on the east and two on the west are wholly of adobe. Near the centre of the main room there is a well-finished doorway, T shaped. The back rooms must have been reached by a ladder in front. The cliff entrance was a narrow opening left in the front wall.

There is another region where cliff-dwellings are numerous, viz.: in the Walnut Cañon, eight miles from Flagstaff. The following is the description given by Mr. Higgins, of the Santa Fé Railroad:

> On the southeast, Walnut Canyon breaks the plateau for a distance of several miles, its walls deeply eroded in horizontal lines. In these recesses, floored and roofed by the more enduring strata, the cliff dwellings are found in great numbers walled up on the front and sides with rock fragments and partioned into compartments.
>
> Fixed like swallows' nests upon the face of a precipice, approachable from above or below only by deliberate and cautious climbing, these dwellings have the appearance of fortified retreats, rather than habitual abodes. That there was a time, in the remote past, when warlike peoples of mysterious origin passed southward over this plateau is generally credited. And the existence of the cliff-dwellings is ascribed to the exigences of that dark period, when the inhabitants of the plateau, unable to cope with the superior energy, intelligence, and numbers of the descending hordes, devised these unassailable retreats. All their quaintness and antiquity can not conceal the deep pathos of their being, for tragedy* is written all over these poor hovels, hung between earth and sky. Their builders hold no smallest niche in recorded history. Their aspirations, their struggles, and their fate are all unwritten, save on these crumbling stones, which are their sole monument and meager epitaph. Here once they dwelt. They left no other print or line.
>
> At an equal distance to the north of Flagstaff, among the cinder-buried cones, is one whose summit commands a wide, sweeping view of the plain. Upon its apex, in the innumerable spout-holes that were the outlet of ancient eruptions, are the cave-dwellings, around many of which rude stone walls still stand. The story of these inhabitants is likewise wholly conjectural. They may have been contemporary with the cliff-dwellings. That they were long inhabited is clearly apparent. Fragments of shattered pottery lie on every hand.

Another region where cliff-dwellings are numerous is situated far to the south of the Pueblo territory, in an extensive mountainous country which can be called a continuation of the Rocky Mountains in northern Mexico. It used to be the favorite haunt of the Apache Indians, and is now seldom visited by the Mexicans, who are entirely paralyzed by the memories of terror and blood-shed and for fear of the roaming bands which are constantly invading the region and keeping alive the fearful traditions of the past.

These now solitary regions, Mr. Lumholtz says, "were once inhabited by races of whom history as yet knows nothing. Many mountain ruins are everywhere found, consisting of square buildings, generally of stone, but occasionally of clay and plaster, which caused them to look white at a distance. Deserted pueblos, consisting of square stone houses, are generally found on top of the hills and mountains, surrounded by fortifications in the shape of stone walls." He says further:

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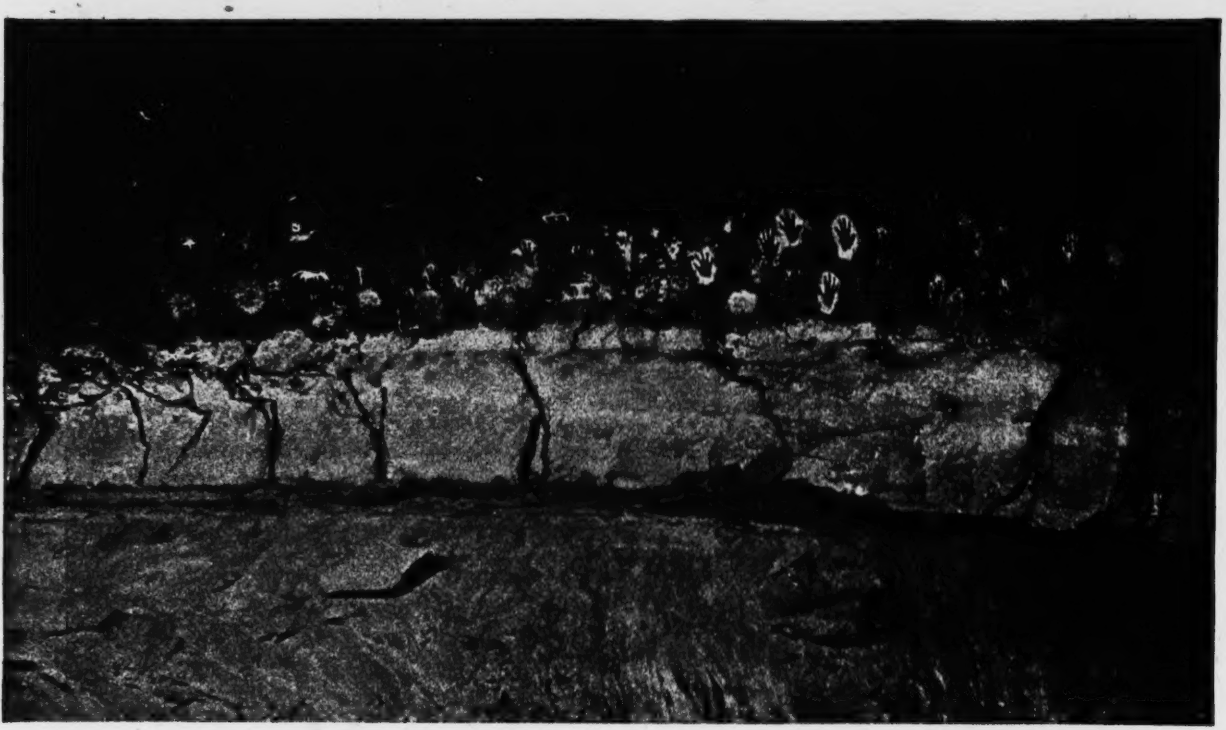
*The same is true of the cliff-dwellings on the San Juan In one on Acowitz Canyon were several skeletons which showed that the Cliff-Dwellers had met with a violent death. In a room which had only one entrance, and that from the top, probably an estufa, four persons had been killed with stone axes. Their skulls had been broken in. They had attempted to escape by the opening or chimney. One man's legs were in the chimney and his trunk in the fire-place; his hands and arms were in the room.

> There are some very remarkable caves in Cave Valley on Piedras Verdes River. On one stretch of twenty miles I counted some fifty caves or cliff-dwellings. They are all made in natural caves and cliffs. Some of these contain small villages, or groups of houses, which are well built, showing, that the inhabitants attained a comparatively high culture. The rock formation is porphyry, which has disintegrated into a dust which in some cases covers the floor of the cave up to the knee.
>
> The cave extends from 100 to 200 feet above the bottom of the canyon, 6 850 feet above the sea level. The openings vary from twenty to fifty feet in height, and the depth in one cave reached 140 feet. In the deepest caves the houses were built at the entrance, while in the smaller ones they were found at the back. The most noticeable feature of these structures is that the walls are about a foot and a half thick, and present a solid surface as much as eight feet in height, all of one piece, and white-washed.
>
> In one cave we found thirteen coats of white-wash on the walls, from which we inferred that the dwelling had been inhabited for a long period of time. This was the finest and most interesting of all the caves we visited. It contained a whole village, and at its entrance we were amazed to come upon a gigantic balloon-shaped vessel, twelve feet in height, and twelve feet in diameter, with a three-feet wide opening at the top. The Mexicans called it an "olla," and insisted that it was a water jar; but I believe that it was built for the storage of grain, and openings symmethically made in the sides of the vessel, as well as a hole three feet high at its base, favor this hypothesis. The framework of this "olla" was composed of coils of grass-ropes, plastered inside and out to the thickness of about eight inches, with the same porphyry pulp of which the dwelling themselves are constructed. The interior of the vessel was as fresh as though it had been made a week ago.
>
> Some ten miles higher up, in the Strawberry Valley, we met with some more very interesting cave- or cliff dwellings. These structures were similar to those mentioned above; one, however, presented the anomaly of being circular in shape. Some were fortified and turned into almost impregnable strongholds, and one was protected by an outside gallery.



PICTOGRAPHS ON ROCKS IN A CLIFF-OUTLOOK.

CLIFF VILLAGE IN SIERRA MADRE, MEXICO.

BALLOON-SHAPED STORAGE CIST.

# CHAPTER IX.

## THE CLIFF-DWELLINGS OF THE CANONS OF THE MESA VERDE.*

We have in the preceding chapter treated of the habitat of the Cliff-dwellers, and have given a general description of their location and distribution. We now give an account of the Cliff-dwellers of a particular district. This account is all the more valuable from the fact that it is furnished by one who has visited the region and studied its geographical and geological features, and made special note of the architectural and archæological peculiarities. We commend the article for its specific descriptions and for the illustrations, which were taken on the spot.

The Mesa Verde, in whose canon cliffs and caves an ancient race have left their architectural remains, is a plateau in southwestern Colorado and New Mexico. Its boundaries are roughly defined on the east by a ridge or so-called "hog's-back," which slopes toward Cherry Creek and the Rio La Plata, on the south by the erosion valley of the Rio San Juan, on the west by the erosion district beyond Aztec Spring Creek, and on the north by the Montezuma valley, or plain; properly, the McElmo valley. It rises from 1,000 to 2,000 feet above its base, which has an altitude above the sea of from 7,000 to 8,000 feet. The canon of the Rio Mancos completely divides this plateau into two unequal portions, as it extends first southward, then southwestward, and finally in a more westerly direction, leaving to the southwest an irregular quadrangle, whose area is probably about 300 square miles. It is to this portion that special attention is called, as it was here that the writer's observations on cliff-dwellings were chiefly made. Its drainage is toward the Mancos, and erosion has produced such an extensive system of canons through it, that it is now the mere skeleton of a mesa and a perfect labyrinth of gorges. Each of these lateral canons of the Mancos has its branches and their subdivisions, which extend in many cases almost to the great northern wall of the mesa that faces the Montezuma plain; so that the whole interior consists of a series of tongues of flat-topped mesa, green with scrub-oak, pinon and cedar, running out from a rim or base upon its northern border, forming partition walls of varying width between

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***This chapter is a reprint from the Bulletin of the American Geographical Society of 1892, and was written by W. K. Birdsall, M. D., who visited the region in the year 1891, and took photographs of the ruins.**

canons of enormous depth, whose yellow sides rise perpendicularly from the steep-sloped talus at the base. Huge promontories of rock jut boldly out where canons subdivide, some carved into strange fantastic forms, others squarely built as if abutments for giant bridges to span the chasms which they limit. The views seen in journeying through these canons, while ever varying in minor details, soon become monotonous from the continued repetition of the greater features. We pass promontory after promontory, canon after canon, which so much resemble each other that the mind, failing to keep the preceding variations before it, becomes bewildered and fatigued. Again, the mesa, to the uninitiated, is a perfect maze; so great are the resemblances between the different branches of the canons and between the promontories that separate them. From some point of view whence a great area of the mesa can be overlooked, it appears as if the earth had been split into innumerable fissures, as the eye courses over the indistinct outlines of canon beyond canon in the distance.

These canons are all the work of erosion in horizontally stratified rocks of cretaceous formation, chiefly sandstone. The upper strata form an escarpment of yellowish sandstone, harder than the lower strata and about 200 feet in thickness. Directly below it are much softer sandstones and shales which have eroded more rapidly in some places than in others, giving rise to shallow caverns or galleries formed by the overhanging cliff of harder rock as a roof; while lower strata, that have also been resistant, form the floor, which is usually much narrower than the roof, varying from a few feet up to fifty or sixty, while the overhanging cliff may project from a few feet to more than a hundred beyond the back wall of the gallery. Below, the wall of rock drops off abruptly, or by an irregular series of narrow ledges, for hundreds of feet down to the talus slope. The height of the galleries above the bottom of the valley varies from 500 to 1,500 feet. They vary in size from mere niches of a few cubic feet capacity to galleries more than a thousand feet in length and fifty feet in height and width.

On these narrow ledges, at these dizzy heights, under these overhanging walls, the cliff-dwellers fastened their houses of stone to the rocks like so many swallows' nests. The question is often asked: Why did they build so high? They built where they found caverns in which to build. Although lower strata exhibit many of these caverns, they are far less numerous and extensive than those under the great escarpment rock.

The canon bottoms are cut up with the "wash" of former streams, benches have been excavated in the talus, and innumerable lateral *arroyos* intersect the longitudinal stream-beds. Partially disintegrated masses of rock add roughness to the view. Tall, coarse grasses, rushes, sage-brush, tangled vines, willow and cotton-wood, make up, chiefly, the vegetation of these bottoms; while upon the higher slopes and ledges, the scrub-oak grows in such profusion that some of these canon walls at a distance appear richly clad in verdure. Indeed, it is this bright-leafed oak, rather than the darker pinon and cedar of the mesa proper, that give it the verdant appearance which must have suggested the name "Mesa Verde."

These canons end mostly in amphitheatres which were favorite sites for cliff-towns. In some, the mesa level was reached by a series of benches and intervening slopes, while others slope gradually to the mesa, or produce a valley in it. Some of these valleys extend so far to the north that they give to the northern face of the mesa a serrated appearance. Few canons have water in them except after showers or the melting of snow. The waters of the few permanent streams are alkaline and usually unfit for man or beast to drink. A spring is a treasure rarely found in the canons, but hollows worn in the rocks become filled by rain or melted snow and furnish the chief supply to the travellers upon the mesa. Some of these rock excavations are quite large and receive the name of "tanks."

It was the writer's good fortune to visit the region thus briefly described under the guidance of Richard, Alfred and John Wetherill during the summer of 1891, for recreation rather than for the purpose of systematic archæological study. For several years these men have devoted a great deal of time to the exploration of this region in search of cliff-houses and the relics they contain; although not professed archæologists, they have amassed a very large collection of the remains of the cliff-dwellers and are in possession of a vast number of observations and facts concerning them. Indeed, no one knows this part of the Mesa Verde as they do. The upper end of the Mancos Canon is the usual place which tourists visit to see a few examples of cliff-houses, and the hospitable Wetherill ranch is the proper outfitting place.

Jackson and Holmes, whose contributions constitute almost the only attempt at scientific literature on the subject of cliff-dwellings, described the ruins in the Mancos Canon, but their observations did not extend to the interior region described in this article. In these branch canons of the Mancos, however, the ruins are far more numerous than in the main canon; a discovery of the Wetherills, who informed me that they have examined between 200 and 300 villages or separate groups of houses, in an area of less than twenty by forty square miles. The greater part of these are in the lateral canons. This region, now so desolate, was once a well-peopled area. While journeying in the saddle through the Mancos Canon or its wider branches occasionally mounds are met with, many strewn with pits of pottery, others exhibiting, upon slight excavation, the remains of adobe or stone walls, some quadrangular, some circular. The base of a distant cliff may reveal a small water-worn recess, showing the remains of a wall of stone which closed it in front —the so-called "cave houses". Looking along the high canon walls in search of cliff-houses, the inexperienced observer is apt to look in vain. He sees every variety of shade and color in the great yellow and brown rocks, projecting masses of every form, shadows of overhanging cliffs and the dark recesses below them; but until he has become familiar with the somewhat paler yellow of the artificial walls and their rectangularly notched appearance he is apt to pass them by even after a careful search. On spying one of these structures a thousand feet or more above, the problem asserts itself: How did the occupants get up to them? It is finally resolved by the answer: They did not, they came down to them from above. The level mesa top was within one or two hundred feet of them; the canon bottom perhaps more than a thousand feet below, hundreds of which might be perpendicular or unsurmountable. When built at lower levels, or at the end of a canon where the slopes permitted, paths and steps leading below are occasionally found, but in most instances the path and steps lead from the house up to the mesa, not down to the bottom. The explorer must adopt the same method if he would work to advantage. He must reach the mesa somehow, and establish himself there as his base for operations. It is only at a few favored points that it is possible to reach the top from the canon below; such places may have been known to the ancient cliff-dwellers, they certainly are known to the Navajoes and Utes, whose trails here and there serve to indicate a way to the top. Some broken down promontory usually affords the conditions. Zigzagging across the talus slope, the ledges are finally reached, and the horseman is glad to leave the saddle and lead or drive his pony over the rough and nearly upright path, around bold promontories with but a narrow ledge for a footing and across great fissures, forcing him to jump from ledge to ledge. The top reached, the saddle resumed, then comes a ride across the level or rolling mesa at better speed. Dodging under and around the branches of low pinon and cedar trees which form a sparse forest, clattering every now and then over mounds strewn with pottery—the mesa burial grounds—in time a place for camping is reached. It must be where water can be had. A natural excavation in the rock, to which led a gullied slope that directed water when it rained, held a few barrels of muddy liquid and served us at one of our camps. Leading down to it were well-worn steps cut in the solid rock.

In hunting for cliff-houses from the mesa, some projecting point will furnish an outlook up or down the canon and may expose to view some group of houses. To find the way down to them is a matter, often, of careful searching. Usually at some point of depression where the ledges are broken, a narrow way will be found. Yet there are instances where a broad and royal path sweeps down around the half circle of an amphitheater to the ledges on which the town was built. Though steps and niches cut in the solid rock are frequent, examples of a regularly laid stairway are rare; we observed one, however, consisting of fifty or sixty steps, each formed of a heavy block of stone, so well placed that they have resisted the ravages of time better than the walls of the large cliff-town to which they led, now almost completely demolished. Sometimes the houses are absolutely inaccessible; portions of the cliff have fallen, ledges have crumbled away, cutting off all access to what may have once been an easily reached dwelling. Ropes and poles are useful accessories to the explorer if he has the courage and the skill to use them. Fragments of notched poles and other ladder like arrangements have occasionally been found, which probably made many places accessible that are now out of reach. Sometimes it is necessary to let one's self down for a considerable distance through great fissures. In the side walls, niches are often found to facilitate the descent and ascent. Again, the only way is over the sloping or rounded face of some smooth rock; here also niches for the hands and feet are not unfrequently seen. They are not deep, perhaps the rock has worn and left them shallower than when first cut, yet they give a foothold, though it be a perilous one. The path may be continued by narrow ledges a few inches in width where the side wall must be closely hugged to maintain equilibrium. Then, possibly a succession of giant steps to lower ledges intervene, and, finally, as we round a point, a great cliff curves upward and under its deep shadow, on the ledges below, rise the ruins of a cliff-town.

No description of a single cliff-house can give a correct idea of them as a class, so greatly do they vary in size, form and location. As in every community we have many grades of architecture, from the hovel to the palace, so here we find a great range in the different features of construction; from the little "cubby-hole" walled up in a corner of the rocks to the remains of what appears to have been a stately tower or an extensive communal house. Yet they all have certain features in common. They are built of blocks of sandstone, broken or cut in regular shapes, laid in a cement of adobe and chinked with small fragments of stone. The rock material used was that of the adjoining cliffs, large masses of which fallen from above were usually at hand and sufficiently soft and fragile to have been easily worked with the stone implements found in the houses. The blocks of stone vary greatly in size, though many walls are faced up with stones about a foot long, eight wide inches and six thick; others are double or triple this size; some are cubical in shape, while in many of the inferior structures the pieces of stone are irregular, of many sizes and shapes, with adobe plastered into the interstices to fill out the deficiences. In the more perfect and substantial buildings, however, the walls exhibit great regularity of form and compactness of construction with as true a face as is shown by many of our modern stone buildings. The lines are usually plumb, the corners are turned at perfect right angles in squarely built houses, while in round structures the circles are quite perfect. A remarkable degree of skill is shown by the manner in which the shapes of the buildings were adapted to the limitations of space which the galleries presented and in the utilization of every available surface. Many of the walls of large buildings rise directly from the extreme edge of the ledge, sometimes even when the slope to the front was considerable, yet, so thoroughly were they laid, that many of them stand to-day, on these apparently unstable foundations in a good state of preservation. Where curves in the gallery existed, the walls were also curved or angled to utilize all the space.

In some of the more spacious caverns a continuous corridor was left in the extreme rear, allowing communication between the separate apartments. On narrow ledges the partitions were carried directly back to the cliff walls and up to the roof of the cavern, provided the latter was not too high. Four stories upward from a single ledge was the highest that came under the writer's observation. As the stories are low, from three to six feet, it is not usual to find walls running higher than twenty or twenty-five feet; ordinarily they are not so high. When a lower ledge existed in front of the main gallery ledge, it was often built upon and the walls carried up to the level of the latter and sometimes above. As these outer structures have not stood as well as the inner ones, it is not possible to say from their ruins how high they were built. When supplementary ledges existed high above the main floor, these narrow projections were often utilized, small compartments being built upon them, too diminutive for human occupation and possibly were used for storage. Fig. 1 exhibits such structures built on narrow sloping surfaces below.

The openings in the walls consist of peep-holes a few inches square, windows and doors. The windows are not numerous, many rooms being entirely without them, while sometimes they are absent from the front walls of an entire village. They vary in size and shape, 18x24 inches being a large size, 12x14 inches a more common proportion. The sill consists of a single flat stone, the lintel of stone or of one or two small cedar poles to give support to the wall of stone above. The doors have similar lintels, but the door sill is frequently absent. The size of the door is also quite variable; they are almost always small, many requiring one to enter on hands and knees, and being barely wide enough to admit an adult person. Not an uncommon size is 2x3 feet. Yet doors five or six feet in height and of ample width are met with in some houses. Some rooms have neither doors nor windows in the side walls, being entered through a hole in the roof—or floor of the next story. These roofs and floors are formed of cedar or pinon poles two to four inches in diameter, some of which were allowed to project a foot or two beyond the outer wall They show that they were cut off with some blunt instrument, probably the stone axe. These larger poles were covered with smaller cross sticks, which were in turn

*Fig. 1.*

covered with adobe cement; sometimes cornstalks and strips of bark were pressed into the adobe while it was yet soft, as these articles are still found imbedded in it. Over this vegetable matter a series of layers of brown and black dirt is often found; whether originally placed there or the accumulated filth from long occupation is uncertain.

The floors between stories have usually fallen in, leaving the broken poles or the holes in the wall through which they protruded. The main walls of the buildings are from one to two feet in thickness, the partition walls somewhat thinner. The size and shape of the rooms vary greatly. They are usually small, 8x10 feet being a large room, 6x6 feet a more common size, while great numbers of little compartments about 3x4 feet are met with; sometimes they are nooks and corners left in completing the larger outlines of the building. The diminutive height of the rooms is also noticeable, four feet being a not unusual height. In the shape of the inner rooms less care is shown in their proportions than in the outer walls; the partitions being frequently out of parallel. The inner surfaces of the walls, in some cases, were simply chinked and the interstices plastered like the outer wall; many of the rooms, however, are smoothly plastered within, and impressions of the fingers and the palmar surface of the hand are occasionally visible. Finger marks are often found in the cement on the outer walls, and their small size has led some to infer that this was woman's work. The plastered walls have in some instances been smeared over with tinted clay of either a brownish or a pinkish hue. Mural decorations are exceedingly rare. A band in black around the upper part of the room has been observed, and occasionally rude attempts at sketching the human figure. Pegs of wood and staples of bent willow or reed let into the wall are frequently found; and probably served as projections on which to hang things. A special description is required of the circular rooms called "estufas," from their resemblance to the circular chambers of this name found in the Pueblo towns. One or more of these structures are to be found in almost every collection of houses. They vary a good deal in size and manner of construction, but are always circular, with somewhat heavier walls than those of the

*Fig. 2.*

adjoining buildings. They have few apertures. A diameter of eight or ten feet is not unusual; much larger ones have been described, but still smaller ones are met with.

Fig. 2 exhibits the ruins of one of these structures, showing a projecting ledge or seat interrupted by a solid mass of masonry. Frequently rectangular recesses exist at intervals in the wall large enough to contain a person sitting with bent knees; smaller recesses are also found. Fig. 3 shows one of them, and also exhibits a smoother portion of the wall covered with plaster, as well as surfaces from which it has scaled. These estufas were usually more perfectly plastered and tinted than the other class of rooms.

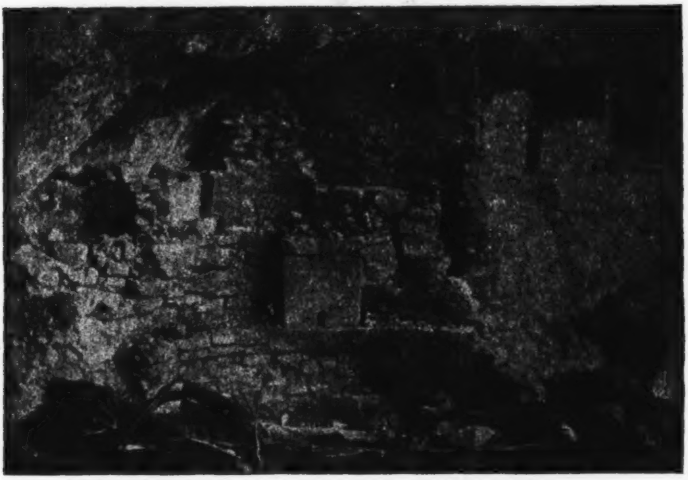

*Fig. 3.*

In the center of the floor a shallow circular basin of baked clay from one to two feet in diameter, forming a solid part of the floor, represents a fire-place; at least fragments and dust of charcoal are found in these basins. Some of the estufas have an aperture about a foot square, opening on the outer wall, and screened within by a little wall of masonry built up from the floor about a foot or two from the wall; whether this was to prevent persons outside from looking in, or for the purpose of distributing the draught, on account of the central fire-place, is uncertain. The interior walls of estufas are usually much blacker from smoke than are the other rooms. The entrance to these apartments is sometimes difficult to discover; narrow subterranean galleries have been described by some writers, but roof openings and apertures high up in the walls were more common. A form of wall construction should be mentioned in which the wall is continued upward upon a few tiers of stone by wicker work, heavily plastered inside and outside with adobe. Concerning the number and grouping of the rooms in different villages as indicated by the ground plan, it may be said that they range from small collections of half a dozen compartments to those with more than a hundred. Richard Wetherill discovered an unusually large group of buildings which he named "The Cliff Palace," in which the ground plan showed more than one hundred compartments, covering an area over four hundred feet in length and eighty feet in depth in the wider portion. Usually the buildings are continuous where the configuration of the cliffs permitted such construction. Many towns present the appearance of having been added to from time to time, as the wants of the community increased. This is suggested by the different degrees of perfection in the masonry of adjoining buildings and by the better or poorer construction of upper stories. Isolated buildings are occasionally met with. Some of these, situated on spurs or promontories which overlook the valleys, have been regarded as towers of defence or points of lookout. The valley

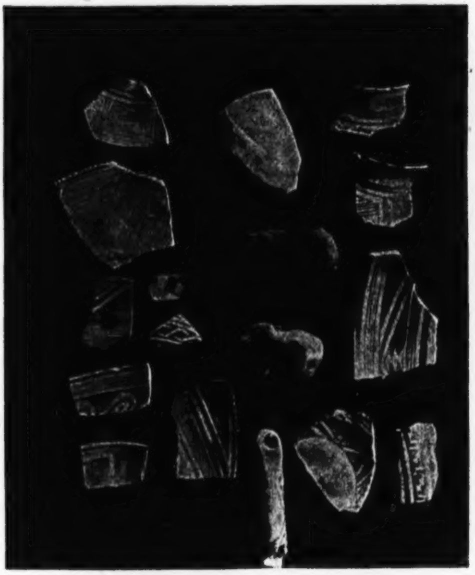

*Fig. 4.*

ruins also exhibit the remains of large isolated round structures, sometimes with a double circular wall, and in the broad valleys are ruins with larger groups of apartments than those in the cliffs, showing a greater resemblance to the Pueblo towns. They probably represent different periods of architecture and were possibly the work of different tribes.

Within the cliff-houses, under the debris of fallen walls and in the refuse heaps about them, various articles have been found which throw further light upon the habits of the cliff-dweller. They may be enumerated and classified in the following manner. Those marked with an asterisk did not come under the writer's observation or verification. For their description and identification Mr. John Wetherill is the informant, and his careful observations may be regarded as trustworthy.

1. Implements for war and the chase.—Bows of wood;* sinew bow strings;* arrows of wood and of reed; flint and bone arrow-points; flint and bone spear-points; flint and bone knives of various sizes; buckskin quiver with arrows;* snow shoes.* Bows and arrows were found by the Wetherills in a sealed room beside the skeleton of a man dressed in a suit of fringed and tanned skins.

2. Tools for building.—Stone axes, polished and unpolished, of various sizes, shapes and materials, chiefly of igneous rock. Fig. 4 exhibits one with polished edge, 6x3 inches; stone hammers, large and small. Both axes and hammers are frequently found with a short handle of wood bound to the stone by strips of yucca.

3. Implements for the manufacture of domestic articles.—Sticks about three feet long, knobbed at one end and worked into a blade at the other, supposed to have been used in beating and preparing the yucca fibre, as they have been found in rooms with bundles of yucca in different stages of preparation.* Awls of turkey bone; bone needles;* flat and rounded stones for shaping pottery, clay for pottery;* flat hide scrapers; sharp sticks and paddle-shaped pieces of wood thought to be agricultural implements; sticks supposed to be part of a loom.*

4. Household utensils.—Knives and spoons of bone; stones for grinding corn (metate stones); hoppers of woven yucca; stone pestles; sharp-pointed sticks for starting a fire;* tinder of bark and of grass; baskets and fragments of basket work made of grass, yucca, rushes, reeds and willow. Baskets shaped for the back have been found with a harness of yucca rope and hide.* Matting of rushes (see Fig. 5) and matting made of willow osiers, perforated at short intervals by small awl holes, through which yucca strings pass, holding them together and parallel. Rings of yucca and of rushes to support unstable pottery; the yucca plant in different stages of preparation for fibre; yucca rope, both twisted and braided forms, cordage,

twine and thread; flat boards, supposed to be "baby boards." One was found with a bed of corn tops on it.* Small bundles of stiff grasses tied in the middle and cut off squarely at both ends; said to be used to-day by the Moquis as hair-brushes or combs.

5. Dress and ornamentation.—Fragments of tanned hides bound with cordage of yucca fibre; fringed buckskin garments; leggings and cloth made of human hair; cotton cloth; cotton cord; yucca fibre cloth; finely woven bands of yucca fibre; socks made of yucca fibre; sandals of yucca with various styles of finish. Fig. 5 shows one exhibiting the heel and toe bands. Some sandals have an in-sole of corn-husks or of soft bark fibre. Feather cloth: this peculiar textile was made by splitting off the downy part of feathers and wrapping the thin layer of quill around a yucca string; a feather cord as large as one's finger is thus formed, and this interlaced and tied together answered for a mantle, such garments having been found as a wrapping for the dead. Bone beads; snail shells perforated for stringing; jet and stone ornaments have been found.

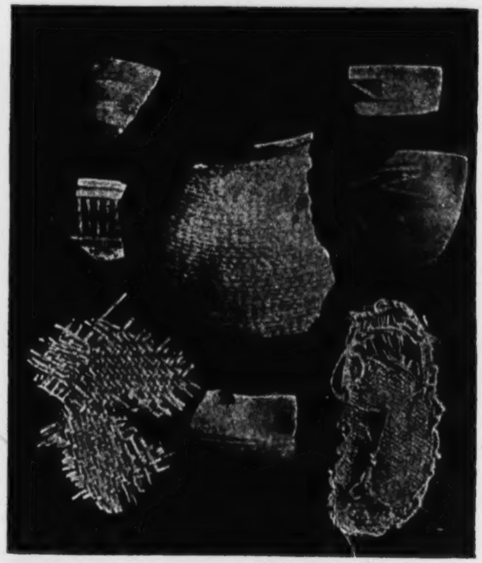

*Fig. 5.*

6. Pottery—Large jars holding from one to several gallons, the so-called corrugated ware (indented ware, coiled ware). Fig. 5

exhibits in the largest fragment a specimen of this peculiar pottery; small jars are made of the same material, aud their shapes vary. Much speculation has been indulged in as to how they were made, some maintaining that they consist of strips of clay coiled spirally and indented with the finger nail; others think that this effect is due entirely to nail indentation. As proof that the nail was used for indenting this ware, the writer has a fragment on which the delicate lines of the skin have been perfectly impressed below the nail marks. The inner surface is smooth. These jars are usually blackened from smoke, as if used for cooking utensils. They are of a coarser material than the smooth pottery, but comparatively thin, considering the size of the jar. Of smooth pottery a great variety has been found; jars large and small, jars with rims for lids, jar lids, jars with side handles, jugs, large and small, pitchers, bowls, mugs, ladles (see handle of ladle, Fig. 4); peculiar little pieces of pottery in which cotton wicking has been found, supposed to be lamps.* Some of the pottery is unglazed and undecorated. The surface of the decorated pottery has a slight glaze upon it, which is in some specimens slightly absorbent. Figs. 4 and 5 show a variety of patterns on fragments. As they are evidently hand designs, the variations are very great.

Tons of fragments of this ancient pottery are scattered over the mesa and in the valleys, as well as in and around the cliff-houses. Either the makers were indefatigable potters, or else the race dwelt long in the land. In truth, we do not know whether they represent different periods, or whether the makers were of different races. That many of the designs are at least as old as the buildings is proved by the fragments, occasionally found imbedded in the abode as chinking material. Less common are fragments of a red pottery without decorations, except peculiar streaks of black through it on the inner surface, and on the outer, indistinct patches of a dull greenish tint. Sometimes a mottled effect is evident. Holes have been drilled through the pottery in some instances, apparently after baking, and broken pottery was mended by tying a string through holes drilled in the fragments.

7. Food supply.—Maize or Indian corn; the stalks, husks, tassels, silk, cob and kernel are frequently found. That some of this material is as old as the building is proved by the fact that the stalks were used in the construction of the floors, being actually imbedded in the adobe; cobs being also used to chink the walls with, an impression of the cob in the now hard adobe being found on detaching one from its bed. Corn husks on the cob, knotted or braided and bunched much as the Eastern farmer treats his seed-corn, are not uncommon. As already mentioned, the husks were used as in-soling for sandals and for the padding of other articles. The corn itself was small, a yellow variety,

some kernels showing a small dent. The cob was also small and short, usually about three inches in length. Jars of shelled corn have been found, but when the kernels are obtained from refuse heaps or open vessels the softer part has generally been gnawed away by some rodent, leaving only the hard outer rim. Efforts to sprout the complete kernels, it is said, have thus far proved unsuccessful. Reddish-brown beans of fair size are frequently found. The stems, rind and seed of gourd-like vegetables of different kinds are abundant; some thin like a gourd, others squash-like, and another kind resembling the pumpkin. A kind of walnut has also been found. The American turkey was evidently an important factor in the domestic economy of the cliff-dweller. His feathers and quills were used for ornament and dress, his bones were worked up into useful household utensils, such as awls and needles, and we can hardly doubt but that his flesh formed an important article of animal diet, if we may judge from the broken bones in the refuse heaps. That this people did not merely hunt the wild turkey, but succeeded in domesticating it seems probable from the abundance of droppings, particularly in certain small compartments, with which are mixed the down and feathers of this fowl. The droppings of smaller birds and different rodents are numerous under the cliffs, the accumulation of ages, but the arrangement, appearances and situation serve to distinguish them in many cases from the deposits just referred to. Deer bones, buckskins, sinews and horn show that one or more varieties of the cervidæ supplied these people with material for food, dress and utensils. The question will naturally arise in the mind of every reader of this list of articles found: How do we know that they belonged to the original builders and occupants of the cliff-dwellings and not to modern tribes, as so many of the articles resemble those known to be in use by Indian tribes? The truth is that in many cases we can not feel sure, yet examples of most of the articles described have been found in situations or under conditions which show most conclusively that they are not recent, but as old as some parts of some of the buildings; as in the instance cited of articles found imbedded in the mortar or under the ancient floors. Again, the uniformity of the findings over widely distant regions, wherever this class of buildings has been carefully examined, is strong confirmatory evidence; yet too much care can not be taken in reaching conclusions in this sort of work.

8. Human remains.—The burial mounds on the mesa contain the decayed remains of human skeletons in abundance, and many in a fair state of preservation, yet nothing but the bodes remain except pieces of pottery buried with the body, these usually in fragments. When the attitude can be determined it is usually the flexed position, the body having been laid on the side. Skel-

etons are also found buried among the ledges, where occasionally under the protection of some large mass of rock sufficient earth has been retained in which a shallow grave could be excavated. The best preserved human remains are found in the dry material under the cliffs. An occasional place of burial was on or under the floor of some room in the building. Sometimes the body was simply laid away in the dry dust, the room being sealed; in other cases the earthen floor covering the body shows the accumulation and effect of use after burial. Where absolute protection from moisture has occurred, mummified remains have been found with the wrappings of the dead, in a more or less complete state of preservation. Although comparatively few have been found, the uniformity of method in dress and attitude shows what was their favorite method of burial. The outer wrapping consists of the willow matting already described. It was a kind of burial case. Beneath this is usually a covering of rush matting, and next to the skin a wrapping of fibre cloth or a mantle of the feather cloth already described. The flexed position on the side is the usual one. The hair of the head has been found partly preserved on some mummies. It is said to be of fine texture, not coarse like Indian hair, and varying in color from shades of yellowish-brown to reddish-brown and black. The writer was not able to verify this by personal observation, as no mummies were exhumed during the trip, but the facts are vouched for by many observers. The Wetherills exhumed one mummy having a short brownish beard. It is possible that a bleaching process may account for the change in color, though this is doubtful; it certainly will not account for the soft, fine texture of the hair. If this observation is corroborated in future findings, as they have been up to the present, an important ethnological fact will be established. A theory prevails in Colorado, which the writer was unable to trace to its originator, that three distinct races inhabited the land, the mesa-dwellers with perfect skulls, the cliff-dwellers with skulls having a perpendicular occipital flattening and the valley-dwellers with skulls having an oblique occipital flattening. The theory is based on the fact that different shaped skulls have been found at these different situations. The number of skulls examined under the writer's observation were not sufficient to establish much; yet he saw skulls removed from the mesa mounds which, contrary to the theory, were both horizontal and oblique flattening. The cliff-house skulls were perpendicularly flattened, and all these flattened skulls were symmetrical. The angle and plane of flattening vary in different skulls, so that it may be readily conceived that in a large number of skulls we might find intermediate grades from the perpendicular to the oblique forms. While the theory advanced may be correct, the objection to accepting it is, that it rests on the examination of too few crania. While there is no doubt of the preponderance of perpendicular flattening in the cliff-dwellers' skulls, we are not justified in concluding that they were necessarily a different race from the valley peoples who flattened their skulls differently. Localities may be found to differ, and the question should be left undecided until a larger number of skulls have been examined and proper craniometric observations made upon them. The specimens of crania seen do not usually impress one as of extremely low grade. They are brachycephalic, but this is in great part due to the occipital flattening. The vault is well rounded, not sloping laterally like the crania of many Indian tribes. The teeth of adults are generally worn flat on the crown. The skeletons, while not exhibiting signs of unusual muscular development, as indicated by the rough points for the attachment of muscles and the curvature of the long bones, were yet well developed and of good stature. The mummy of a man found by the Wetherills measured 5 feet 10 inches, and that of a woman 5 feet 6 inches.

9. Rock marking.—Attention has been called to the almost total absence of figures, decorative or otherwise, on the walls of the buildings. Rude characters, inscriptions and pictures are also very rare in the canons of the Mesa Verde. A line cut in a spiral was the only object of the sort that came under the writer's observation; a photograph of this was lost by a faulty exposure. Their entire absence in so many of these more isolated villages should make us doubtful about the origin of those found on the valley walls, along lines of travel which modern tribes have used,

Grooves in the sandstone, where stone implements have been ground and sharpened, may be seen on the ledges about almost every dwelling; broad, hollow grooves that would fit the larger axes, narrow lines where probably a bone awl was ground, or other sharp implement.

At certain levels, in some canons, bituminous shales and thin seams of coal appear. John Wetherill states that he has found coal cinders in the ash heaps and fire basins of cliff-towns near such outcropping, and regards this as proof that they recognized the value of coal as fuel and utilized it.

# CHAPTER X.

## HISTORY AND ARCHITECTURE OF THE PUEBLOS.

In giving the traditionary history of the pueblos we shall include only those tribes which had their seats on the Great Plateau, and who still occupy those peculiar habitations to which the expressive name of "Pueblo" has been given, but must exclude those tribes who formerly had their homes among the cliffs, or the Cliff dwellers, so called. These are supposed to have belonged to the same stock as the Pueblos, and to have followed the same mode of life; but they were driven from their homes so long ago that they can not be identified, and no record of their past can be secured. It is strange that with so many monuments scattered over the Great Plateau of the interior that the materials for history should be so meagre; but this is in accord with the condition of society. The people may have reached a high degree of art and architecture, and left structures behind them which are very suggestive, but having had no letters or fixed method of making a record of events, their history has perished. It is only among the few survivors that we can look for those traditions which will explain the structures or furnish a clew to the customs of the past. The traditions which we shall consider will be those which have been preserved among the Tusayans. These are important, for they not only cover the history of this people, but they suggest many things in reference to the tribes which formerly adjoined them. There is a great similarity between their traditions. They embrace about the same events. They all begin with the Story of Creation, and describe the various migrations, and speak of the changes which occurred and the reason for the changes. They contain allusions to the attacks of wild tribes and the conflicts which occurred among their own tribes. They generally end with the final settlement in some chosen locality, and in the combination of the different tribes in making villages or groups of villages.

The wanderings of the Tusayans and Zuñis were, to be sure, confined to the limited territory of Colorado, Arizona, New Mexico and the north of Mexico; and the starting point can not be discovered as occurring in any other region. In this respect they differ from all other aboriginal tribes of America and especially from the so-called civilized people—the Aztecs and Toltecs.

The Aztecs speak of having departed from the "seven caves," and of spending many years in their long migrations. Caves are mentioned as the starting place or station in the migration of the Chichimecs and the Toltecs.[*] Some have thought that this proves that the Aztecs and the Toltecs were the same people who formerly occupied the pueblos; but the point has not yet been confirmed, either by the evidence of architecture or even by tradition. This, however, can be said, that the Tusayans were a very ancient people on the Great Plateau and they were more nearly allied to the Aztecs than they were to any of the wild tribes, such as the Navajos and Apaches, who occupied the same territory at the beginning of history.

When they were invaded by the Navajos[†] these ancient people left their homes in the valleys and constructed temporary homes in the cañon walls, as cliff ruins are abundant throughout the region.

Ultimately the ancient Cliff-dwellers succumbed to the Navajos and were driven out. A part joined the tribes in the valley of the Rio Grande, others joined the Zuñi and the people of Tusayan. Still others pushed on to the valley of the Gila.[‡] As to the relative age of the tribes very little can be said. The traditionary history of the Navajos,[§] including their mythology, covers a period of from five hundred to seven hundred years. The same period might be ascribed to the Cliff-dwellers, but strange to say the history of the Tusayans can not be carried back much farther than this.

Toltec records reach back to an earlier period. They contain the Nahua annals from the time of the deluge, or even from the creation; but their wanderings terminated in the building of the city and pyramid of Cholula. The Aztec records are contained in charts or picture records. Their wanderings culminated in the building of the great city of Mexico.[||]

As to the early condition of these pueblo tribes very little is known, and yet so far as it is known, it contrasts strongly both with that of the Aztecs and Toltecs of the south and that of the wild tribes, such as the Apaches and Navajos, to the north.

According to tradition, the Aztecs were, at a very early date, somewhat advanced in civilization, or if not this, they very rapidly acquired the arts of civilization from their neighbors, the Toltecs. The Navajos, on the other hand, according to their own traditions and myths, were, at the outset, and continued to be, wild hunters and mountaineers, and never settled down to permanent seats or to an agricultural life. The earliest condition of the Pueblos was that of an agricultural people, who dwelt in houses and depended upon irrigation for subsistence. Their migrations from one place to another were caused by a lack of rain and the attack of enemies. There is another difference also between the Pueblos and all other tribes and nations. They speak of having dwelt in houses, the ruins of which mark their various stopping places. So their migration routes are much more likely to be identified than either the Aztecs, who speak of caves, or of the wild tribes who speak of the mountains as their former dwelling place.

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[*] The Choctaws, or Muscogees, according to their traditions, migrated from the Mountain of Fire, which was situated to the far west They were led by the leaning pole for many months and years, and finally crossed the "great river" and settled in the Gulf states, where they began to build mounds.

[†] The Navajos belong to the Athapascan stock of British America and are allied to the Apaches. Their migrations began in the far north and brought them to the mountain region, which is situated on the San Juan. The most interesting ruins of America are found in this region. and the ancient pueblos here are of superior structure. They were all built by people whom the Navajos displaced when they migrated from the far north.

[‡] See Canyons of the Colorado, by Major J. W. Powell, p. 53.

[§] The Navajo mythology begins with the creation and the wanderings of the Navajo war gods. The divine brothers went to the San Juan Valley to dwell. They brought from the houses in the cliffs the ears of corn from which the first pair were made. Their home was in the house of the dark cliffs Since this pair was created seven times old age was killed. The age of an old man was a definite cycle of one hundred and two years. This would give a period of from five hundred to seven hundred years since the first gentes of the dark cliff houses were created See Journal of American Folk-Lore—"A Gentile System of the Navajo Indians," by Dr. Washington Matthews, Vol. III., No. 9, p. 89.

[||] The Toltec migration is placed by most authorities between the sixth and seventh centuries, Aztec migration, about the fourteenth century.

The names applied to the ancient Nahua dwelling places are Aztlan, Culhuacan, (Culiacan?), and Azuilasco.

With this introduction let us turn to the history of the Tusayans. This is contained in their traditions and their architecture.

I. We begin with their tribal traditions and their migration myths. We are indebted to several gentlemen, who have made their homes among the Tusayans, for securing the creation myths, and properly interpreting them.[†] Among these gentlemen we would place Mr. A. M. Stephen as first; but along with him we would mention Dr. Washington Matthews, Mr. Frank H. Cushing, and Dr. J. Walter Fewkes. Mr. Stephen says the creation myths of the Tusayans differ widely, but none of them designate the region now occupied as the place of their creation, or genesis. They are socially divided into totemic groups, each one of which preserves a creation myth. All of them claim a common origin in the interior of the earth; but the place of emergence is in widely separated localities. The following is the story: In the beginning all men lived together in the lowest depths in a region of darkness and moisture. They suffered great misery, but through the intervention of the great divinity *Myungwa*, the god of the interior and of Baholikonga, a crested serpent, the genius of water, the ancient men were led up through four different houses or caves. The means by which they came up was the magic cane, the seed of which the "old men" had received from the divinity. It penetrated through a crevice in the roof over-head and mankind climbed to a higher plain. A dim light appeared in this stage and vegetation was produced. Another magic growth of cane afforded the means of rising to a still higher story or plain, on which the light was brighter, vegetation was reproduced, and animals were created. The final ascent to the surface, which was the fourth plain, was affected by a similar magic growth and was led by mythic twins. According to

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[*] Quoted by Mr. Cosmos Mindeleff in the Fifteenth Annual Report of the Bureau of Ethnology.

some of the myths it was accomplished by climbing a tall pine tree; according to others, by climbing a cane, the alternate leaves of which afforded steps as of a ladder.* A similar myth prevails among the Navajos; but the place of emergence was located by them in the Navajo country. There was one mountain on the east like San Mateo; one on the west like San Francisco; one on the north like San Juan; one on the south like the heights beyond Salt Lake. When they came the land was not empty, but another race of people dwelt in the mountains. The seed grew every night, but did not grow in the day-time. This accounted for the solid nodes in the reed or cane. The Navajos have also a tradition of the flood—that the water east, south, west, and north flowed over the land, and the people fled to the mountains of the north.† The Tusayans maintain that the outlet through which mankind came has never been closed, and through it the great divinity sends the germs of all living things. It is still symbolized by the hatchways of the kivas, by the designs on the sand altars, by the unconnected circle painted on pottery, and by devices on basketry. When the people came to the surface they were collected into different families, or tribes, and placed under the direction of twins (Pekonghoya and Balingahoya), the echo, assisted by their grandmother, the spider woman. They distributed gifts among the people and assigned each family a pathway, and so the various families were dispersed. The legends indicated a long period of migrations in separate communities. One community, the Hopituh, after being taught to build stone houses, was also divided and took separate paths. The groups came to Tusayan at different times and from different directions. The legend goes on to state that the people lived in snake skins, which hung on the end of a rainbow. A brilliant star rose in the southeast. The people cut a staff and set it in the ground, waiting until the star came to the top of the staff. They started and traveled as long as the star shone above the staff. When it disappeared they halted, and built houses during their halt. They built both round and square houses. All the ruins between here and Navajo Mountain mark the places." This is the story of the Snake people.

Another story is told by the Horn people. They came from a mountain region in the east, over which roamed the deer, antelope, and the bison. They tell of protracted migration and of halting places. One of these halting places was a cañon with high, steep walls, in which was a flowing stream. This was the Tsegi, the Cañon de Chelly. At first many of the Horns were dissatisfied with their cavern homes, and so they left the cañon and finally reached Tusayan.

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*Annual report of Bureau of Ethnology for 1886 and '87. P. 17.
†See American Antiquarian, Vol. V. No. 3. p. 298.

The Bears also lived among the mountains of the east. They, too, came to the Tsegi, Cañon de Chelly, where they found houses, but no people. They did not remain there long, but moved farther west, to the place occupied by the Fire People, who lived in a large house. The ruin of this house still stands and is called the fire house.

It is admitted that the Snake people were the first occupants of the region, but not long after the arrival of the Horn people the Squash people came. They say that they came from Palatkawbi, the "red land," in the far south, and for a long time they lived in the valley of the Colorado Chiquito.[*] They still distinguish the ruin of their early village there, which was built as usual on the brink of a cañon. They built no permanent houses until they reached the middle mesa in the vicinity of Chukubi, near which are ruins which they claim to have been theirs. The sites of the ancient Squash villages are marked by high columns of sandstone called guardians, very much as the site of the Walpi village is marked. The Squash village on the south end of the mesa was attacked by a fierce band of Apaches, who completely overpowered them. The village was then evacuated and the material removed to a high summit, where they reconstructed their dwellings around the village Mashongnavi. This tradition is important, for it shows that the villages were first located in the valleys or on the first mesa, but were afterward built on the high summits for the sake of protection.

The next to follow them were the Bear, Bear-skin Rope, and the Blue jay. They came from the vicinity of San Francisco Mountain. They built a village on the south end of the mesa close to the site of the present Mashongnavi. Soon afterward came the Burrowing Owl and the Coyote from the vicinity of Navajo Mountain in the north. They also built upon the Mashongnavi summit. Straggling bands of various other groups are mentioned as coming from other directions. The old traditionists at Shumopavi hold that the first to come there were the Paroquet, the Bear and the Blue-jay. The ruins on a mesa about ten miles south are the remains of a village built by them before they reached Shumopavi. Other groups followed—the Mole, the Spider and the Wiksrun.[†]

Shumopavi received no further accession of population. No important event seemed to have occurred there for a long period, though mention is made of the ingress of "enemies from the north." The Oraibi traditions tend to confirm those of Shumopavi. This story is that the first houses were built by Bears who came from the latter place; but their houses were afterward destroyed by the "enemies from the north." There was a contention between the people and two villages were built, and half way between the two a stone monument was placed to mark the boundary of the land. This monument still stands. On the end is carved a huge semblance of a head or mask, the eyes and mouth being round, shallow holes with a black line painted around them.*

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[*] The ruins of this village cover an area of 800 by 250 feet. There is a spring near by in a tall red grass, which grew abundantly there.

[†] The Wiksrun took their name from a curious ornament worn by the men. A piece of the leg bone of a bear, made hollow and a stopper fixed in one end, was attached to the fillet binding of the hair and hung down in front of the forehead.

The legend of the Eagle people introduces them from the west, coming in by the way of the Moenkopi water course. They found many people living in Tusayan—at Oraibi, near the middle mesa, and near the east mesa. They moved to a large mound just east of Mashongnavi, on the summit of which they built a village. Numerous traces of small-roomed houses can still be seen on this mound. They afterward quarreled with this people and moved to the Snake village, where they built their houses. The land around the east mesa was then apportioned out to the Snakes, Horns, Bears, and Eagles—each receiving separate lands and these old allotments are still maintained.

The Sun people claimed to have come also from the old land in the south. On their northward migration they came to the valley of the Colorado Chiquito and found the Water people there. They built on the terrace close to the Squash village and spread their dwellings over the summit. Their village takes its name from a rock near by, which is used as a place for the deposit of votive offerings. Incoming people from the east had built the large village of Awatubi upon a steep mesa about nine miles southeast from Walpi. This village is remarkable for the tragic event, which occurred late in history, by which its inhabitants were entirely destroyed.

The next arrival seemed to have been the Asa people, who in early days lived in the region of Chama in New Mexico. They moved westward to Santo Domingo, to Laguna, to Acoma, to Zuñi, and finally reached Tusayan by way of Awatubi. The Asa people were among the last to arrive. They were not at first permitted to come up to Walpi, but for some valuable services in defeating the raids of the Utes and the Navajos, they were given planting grounds on the mesa summit; but after a succession of dry seasons, which caused a scarcity of food, they moved seventy miles northeast of Walpi to the Cañon de Chelley, where they built houses along the base of the cañon walls, and dwelt there for two or three generations. Here they intermarried with the Navajos, and a clan of the Navajos is still named after them—"the Highhouse people."

The Asa people returned to Walpi and found the houses

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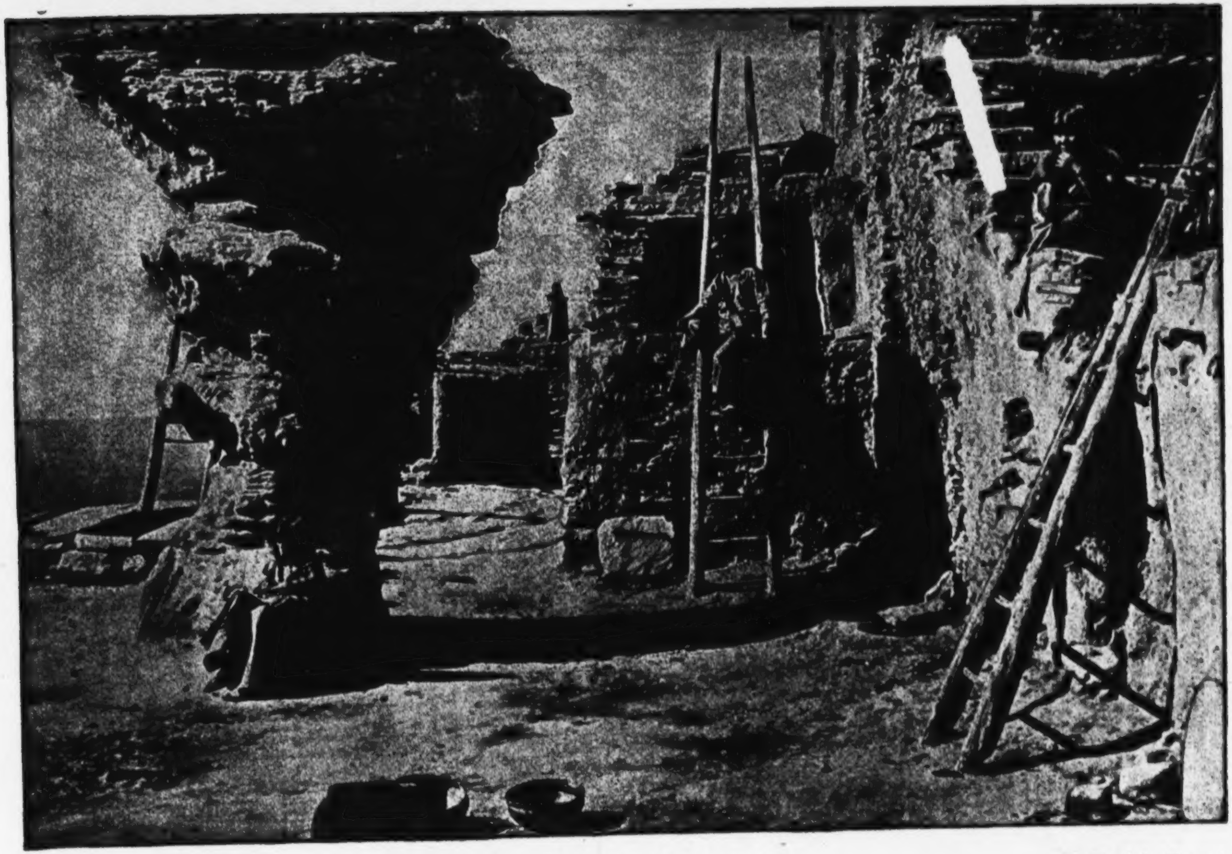
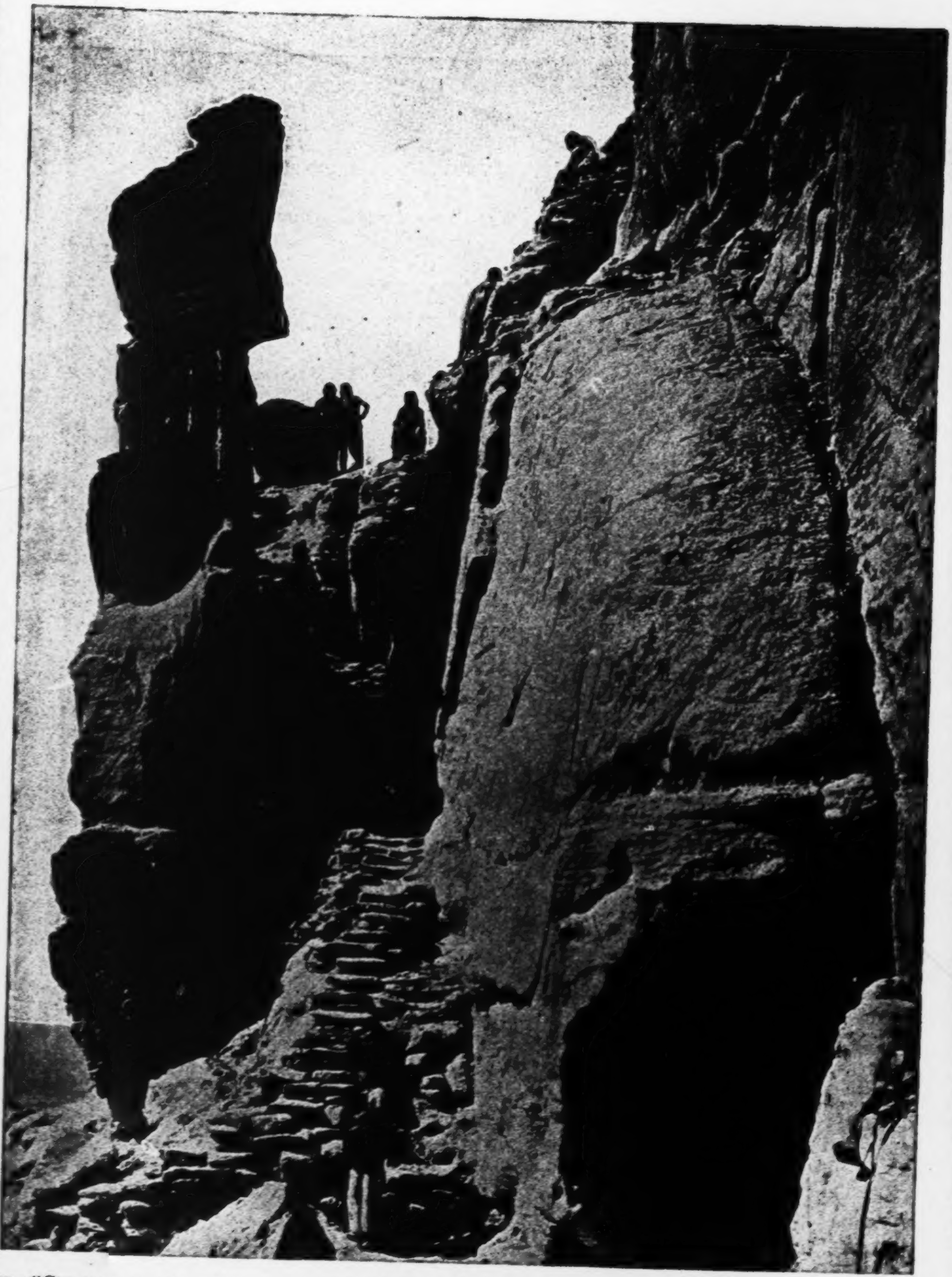
*This monument reminds us of the stones which are found in France with the eyes, mouth and breasts carved upon them to represent the female divinity. They also remind us of the custom which survived in historic times; for the ancient Roman termini were also marked with human faces. See L'Anthropologie, Tome V., No. 2, March and April, 1894, p. 156 and 176.



From "Canyons of the Colorado" SAND-STONE COLUMNS AT WALPI. By Flood & Vincent.



*From "Canyons of the Colorado"* TRAIL UP THE MESA AT WALPI. *By Flood & Vincent.*

occupied. They were taken into the village of Walpi, but were given a vacant strip on the east side of the mesa, where the main trail came up to the village. The Ute, Navajo and Apache had frequently gained entrance to the village by this trail, and to guard it the Asa people built a house group along the edge of the cliff at that point, immediately overlooking the trail, where some of the people still live, and the kiva there, now used by the Snake order, belongs to them. (See plate.) There was a crevice in the rock, with a smooth bottom extending to the edge of the cliff and deep enough for a kikoli. A wall was built to close the outer edge, and it was at first intended to build a dwelling house there, but it was afterward excavated to its present size and made into a kiva.

The last to arrive was the "Water Family." In the story of their wanderings, reference is made to their various villages in the south, and to the rocks where they carved their totems. Their story is as follows:

In the long ago the people lived in the distant south, but were bad. The divinity, Baholikonga, got angry and turned the world upside down and water spouted up through the kivas and through the fire-places in the houses. The earth was rent in great chasms and water covered everything except one narrow ridge of mud, and across this the serpent deity told all the people to travel. As they journeyed across the feet of the bad slipped and they fell into the dark water; but the good, after many days, reached dry land. While the water was rising around the village the old people got on the tops of the houses, for they thought they could not struggle across with the younger people; but Baholikonga clothed them with the skins of turkeys and they spread their wings out and floated in the air just above the surface of the water, and in this way they got across. The turkey tail dragged in the water, hence the white on the turkey tail now. Wearing these turkey skins is the reason why old people have dewlaps under the chin, like a turkey; it is also the reason why old people use turkey feathers at the religious ceremonies.

The Water people formerly lived south of the Apache country, where they built large houses and painted the rain clouds on the rocks. When they traveled north they came to the Little Colorado near the San Francisco Mountains. Here they built houses, made long ditches to carry the water from the river to their gardens. Here they were tormented with sand flies, which forced them to resume their travels. They began a long journey to the summit of the table-land on the north. They camped for rest on one of the terraces where there was no water. Here the women celebrated the rain feast. They danced for three days and on the fourth day the clouds brought them a heavy rain.

The following is the legend: The Walpi came to visit us and asked us to come to their land and live with them. It was planting time when we arrived. The Walpi celebrated their rain feast, but brought only a mere misty drizzle. Then we celebrated our rain feast and planted. Great rains and thunder and lightning followed, and the first day after planting our corn was half-arm's length in height, the fourth day it was its full height, and in one more it was ripe. When we were going up to the village of Walpi we were met by a Bear-man, who said that our thunder frightened their women and we must not go near. After we got to the village the Walpi women screamed out against us, and so the Walpi turned us away. "Then our people traveled northward until they came to the Tsegi in the Cañon de Chelly, but they came back and built houses and have lived here ever since."

It was during their sojourn in Cañon de Chelly that the terrible destruction of Awatubi occurred. This took place at a time of the feast, when the youths who had been qualified by certain ordeals, were admitted to councils. At these ceremonies every man must be in the kiva to which he belongs, as they last several days, and the concluding night special rites are held. The Walpis on this night crept up the steep trail to the summit and stole around the village to the courts holding the kivas. They snatched up the ladders through the hatchways, which was their only means of exit. They threw bundles of fire into the kivas and piles of fire-wood were thrown upon the blaze until each kiva became a furnace. They cast red pepper upon the fire and stood showering their arrows into the mass of struggling victims. The date of this massacre was 1692.

Such is the traditional history of the Tusayans. Its importance will be seen in the fact that it accounts for the location of many of the pueblos and the ruins which are near them. It also explains many of the customs which still prevail, and throws much light upon the architecture of the region, which is generally correlated to the customs and myths.

II. We shall now proceed to consider the various pueblos, which were built and are still occupied by the Tusayans. Let us take the location of the pueblos. On this we must acknowledge our indebtedness to Mr. Mindeleff, who made a report of a survey of the pueblos to the Ethnological Bureau. He says the plateaux of Tusayan are generally diversified by cañons and buttes, which have remarkable similarity of appearance. The arid character of the district is especially pronounced. The occasional springs are found generally at great distances apart, which occur in obscure nooks, reached by tortuous trails. The series of promontories or mesas are exceptionally rich in these springs. The ruins described comprise but a few of those found in the province. They were surveyed and recorded for the sake of the light that they might throw upon the relation of the modern pueblos to the innumerable stone buildings of unknown date, so widely distributed over the plateau country. In taking up the descriptions which are given by Mr. Mindeleff, we shall notice: (1.) The location of the pueblos near some spring or water course. (2.) The proximity to peculiar objects in the landscape, such as columns of sandstone, about which traditions and myths were supposed to linger. (3.) The trails which led across the country and connected the villages with one another. (4.) The presence of high, isolated mesas or rocks, which serve for defenses in case of prolonged attack. (5.) The peculiar arrangement of the buildings around an enclosed court. (6.) The presence of the kiva near the court. Mr. Mindeleff takes the villages in their order, but shows that the elements prevail in each.

1. Walpi —Of all the pueblos occupied or in ruins within the provinces of Tusayan or Cibola, Walpi exhibits the widest

departure from the typical arrangement. The confused arrangement of the rooms, mainly due to the irregularities of the site, contrasts with the regularity of some of the other villages, and has no comparison with most of the "ancient works." The general plan confirms the traditional accounts of its foundation. According to these its growth was gradual, beginning with a few small clusters, which were added to from time to time, the site having been chosen on account of its favorable position as an outlook over the fields. Yet even here an imperfect example of a typical enclosed court may be found at the point where the principal kiva, or ceremonial chamber of the village, is situated. An unique feature in this kiva is its connection with a second subterranean chamber, which is said to connect with an upper room within the cluster of dwellings. The rocky mesa summit is quite irregular in this vicinity. The kiva is subterranean and was built in an accidental break in a sandstone. On the very margin of this fissure stands a curious isolated rock, which has survived the general erosions of the mesa.* It is near this rock that the celebrated snake dance takes place, although the kiva from which the dancers emerge to perform the open-air ceremony is not adjacent to this monument. A short distance farther toward the north occur a group of three more kivas. These are on the very brink of the mesa and have been built in recesses in the crowning ledge of sandstone of such size that they could conveniently be walled up on the outside, the outer surface of rude walls being continuous with the precipitious rock face of the mesa.

The positions of all these ceremonial chambers seem to correspond with exceptionally rough and broken portions of the mesa top, showing that their location in relation to the dwelling clusters was due largely to accident and does not possess the significance that position does in many ancient pueblos built on level and unincumbered sites, where the adjustment was not controlled by the character of the surface.

The Walpi promontory is so abrupt and difficult of access that there is no trail by which horses can be brought to the village without passing through Hano and Sichumovi, traversing the whole length of the mesa tongue, and crossing a rough break or depression in the mesa summit close to the village. Several foot trails give access to the village, partly over the nearly perpendicular faces of rock. All of these have required to be artificially improved in order to render them practicable. The plate from a photograph illustrates one of these trails, which, a portion of the way, leads up between a huge detached slab of sand-stone and the face of the mesa. It will be seen that the trail at this point consists, to a large extent, of stone steps that have been built in. At the top of the flight of steps, where the trail to the mesa summit turns to the right, the solid sandstone has been pecked out so as to furnish a series of foot-holes, or steps, with no projection or hold of any kind alongside. There are several trails on the west side of the mesa leading down both from Walpi and Sichumovi to a spring below, which are quite as abrupt as the example illustrated. All the water used in these villages, except such as is caught during showers in the basin-like water pockets of the mesa top, is laboriously brought up these trails in large earthenware canteens slung over the backs of the women.

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* See Plate. This is the rock which appears so conspicuously in all representations of he snake-dance. The kiva may be seen close by and the stairway to the valley in front of it.

Supplies of every kind, provisions, harvested crops, fuel, etc., are brought up these steep trails, and often from a distance of several miles, yet these conservative people tenaciously cling to the inconvenient situation selected by their fathers long after the necessity for so doing has passed away

2. Mashongnavi.—This was originally near a large isolated rock known as the "giant's chair;" but the present village was built against a broad massive ledge of sandstone and is conformed to the site as closely as Shupolavi, which is seen in the distance.* It is a compact, but irregular village and conforms to the general outline of the available ground. The eastern portion of the village forms a more decided court than do the other portions. One uniform gray tint, with only slight local variations in character and finish of masonry, imparts a monotonous effect of antiquity to the whole mass of dwellings By far the largest number of pueblos if occupied for any length of time must have been subject to irregular enlargement. A few ancient examples are so symmetrical in their arrangement that they seem to be the result of a single effort. Another feature that suggests greater antiquity is the names of the occurrence of the kiva here; for the builders evidently sought to secure its enclosure within the court, thus conforming to the typical pueblo arrangement. The general view given of Mashongnavi, as well as that of its neighbor, Shupolavi, was not particularly defensible; and this fact secured adherence to the first plan of the pueblo, which was built with the defensive inclosed court containing the ceremonial chamber. The other courts were added as the village grew. Each added row facing toward the back of an older row, producing a series of courts with the terraces on the western sides, carry out a fixed plan. This was the case at the pueblo Bonito on the Chaco, where the even curve of the exterior defensive wall, four stories high, remained unbroken, where the large inclosed court was surrounded by the wings. See plates which illustrate this. In the case of Mashongnavi the enlargement of

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*The presence of the sand-stone column is significant, for it would seem as though many of the pueblos were located near such objects conveying the idea that there was a sacredness about them.

the pueblo was at various supposed periods; but the original building followed the plan of making the outer walls a defense, while the inner walls were arranged in terraces surrounding an enclosure. Nearly all the dwelling apartments open in wards upon the enclosure.

The arrangement of dwellings about a court characteristic of the ancient pueblos continued. Their clustering seems to have gone on around the center. Although a street or passage-way intervenes, it is covered with two or three terraces, the upper part having an insecure foundation.* The general view of this village strikingly illustrates the blending of the rectangular forms with the angular and sharply defined features of the surrounding rock, and the correspondence is greatly heightened by the similarity in color. Mr. Stephen has called attention to this in the case of Walpi, where the buildings come to the very mesa's edge, and in their vertical lines appear to carry out the effect of the vertical fissures in the upper benches of sandstone. He thought that this indicated a distinct effort at concealment on the part of the builders. Such correspondence with the surroundings forms a striking feature of many primitive types of construction.† This is illustrated in the case of Mashongnari and Shupolavi, which, when seen at a distance, can hardly be distinguished from the rocks from which they are built.

3. The pueblo of Shupolavi is the smallest of the Tusayan group and illustrates the supposed use and principles of an inclosed court. The plan of this village shows three covered passage-ways similar to those noted in Walpi. "Its presence may be due to a determination to adhere to the plan of a protected court while seeking to secure convenient means of access to the enclosed area." Mr. Mindeleff speaks of the Zuñi pueblo as having a number of these covered passage-ways. He says the highest type of pueblo construction embodied in the large communal houses of the valleys could have developed only as the builders learned to rely for protection upon their architecture, and less upon the sites occupied. The Zuñis seemed to adhere to their valley pueblo through great difficulties.

4. Shumopavi, compared with the other villages, shows less evidence of having been built on the open court idea, as the partial enclosures assume such elongated forms, with straight rows of rooms. An examination shows that the idea was present to a slight extent. At the southeast corner of the pueblo there is a very marked approach to the open court, though the easternmost row has its back to the court. Two covered passages give access to the southeast portion of the court. The kivas are four in number, of which but one is within the village. Three kivas are subterranean, and in order to obtain a suitable site near the

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*See Plate showing passage-way at Walpi.
†See Annual Report of the Bureau of Ethnology, 1886-87, p. 72.

mesa's edge, are located at a distance from the village itself. The stonework of the village possesses somewhat a distinct character. The masonry resembles ancient work. Shumopavi is the successor of an older village, the ruins of which still exist.

5. Oraibi is one of the largest modern pueblos and contains nearly half of the population of Tusayan. The general plan shows a large collection of typical Tusayan house, rows which faced eastward. The rarity of covered passage ways in this village is noteworthy and emphasizes the difference between the Tusayan and Zuñi ground plans. The occupation of a defensive site has, in a measure, taken the place of a special defensive arrangement or a close clustering of rooms. Further contrast is afforded by the different manner in which the roof-openings have been employed. In the Zuñi a number of openings were intended for the admission of light, a few only provided with ladders. In Oraibi not more than half were intended for light.

6. Moenkopi. About fifty miles west of Oraibi is a small settlement used by a few families during the farming season. Here a large area of fertile soil can be conveniently irrigated from copious springs in the side of a small branch. The village occupies a knoll at the junction of the branch with the main wash.

This review of the Tusayan villages has its bearing upon the traditionary history of all the pueblos. It shows that there was a uniform style of building; but the departure from this occurred at a modern date. This enables us to decide as to what pueblos are the most ancient. It may be said that if we go away from the sites of Tusayan and Zuñi in a northwest direction we shall find in the Cañon de Chelly that the pueblos were more ancient; although of the same general type. If, on the other hand, we go to the west we shall find that on the Rio Gila the pueblos were not only more ancient, but of a different type. This confirms the traditions which are extant among the Tusayans. We shall need to take a larger scope to understand the entire history.

III. The architecture of the pueblos furnishes us with many hints as to their history, and confirms these traditions.

Let us consider for a moment the peculiarities of this architecture. Several authors have written upon this subject and given their opinions. Among them the first to be mentioned is Mr. L. H. Morgan, now deceased. His theory was that the pueblos were all based upon a defensive principle, but with a peculiar adaptation to communism. He thinks that in the region of the San Juan river, in New Mexico, in Mexico, and in Central America, there was one connected system of house architecture and substantially one mode of life. "The Indians north of New Mexico did not construct their houses more than one story high or of more durable materials than a frame of poles, or of timber covered with matting, bark or earth. A stockade around their houses was their principal protection. In New Mexico going southward are met, for the first time, houses constructed with several stories. In Yucatan and Central America Indians in their architecture were in advance. Next to them were the Aztecs. Holding the third position were the village Indians of New Mexico. All alike depended on horticulture for subsistence—cultivation by irrigation. Their houses represent together an original indigenous architecture which, with its diversities, sprang out of their necessities."

Its fundamental element was the communal type combined with the provisions for defense. The defenses were not so much to protect the village Indians from one another as from the attacks of migrating bands flowing down upon them from the north.

He further says that "the progress of improvement in architecture seems to have been from smaller to larger rooms followed by a reduction of the size of the house in ground dimensions." "An examination of some very old ruins in New Mexico east of the Rio Grande near Santo Domingo reveals the fact that the pueblo was more like a cluster of cells than of rooms, as many of them were but four or five feet square and contrasted strongly with the present inhabited pueblos."

Mr. Morgan thinks an early seat of Indian village life was in the San Juan district, in the valley of the *Chaco* on the *Animas River*, in the Montezuma Valley, on the Hovenweep, on the *Rio Dolores*. And here was the most ancient development of ancient village life in America. Cave-dwellings or cliff-houses are in the San Juan district, the most of them being on the *Mancos River*. He further says it is probable that the original ancestors of the principal tribes of Mexico, Yucatan and Central America once inhabited the San Juan district, and the Mound-builders may have come from the same country, and as proof he refers to the current tradition that these people painted their original home in the manner of a cave and they came out of seven caves to people the country of Mexico. The evidence of occupation and cultivation through the greater part of this area is sufficient to suggest that the Indian here first attained the middle status of barbarism, and sent forth migrating bands who carried this advanced culture to the Mississippi Valley, Mexico and Central America, and not unlikely to South America. They planted gardens and constructed houses as they advanced from district to district, and moved as circumstances prompted, their migrations continuing through centuries of time.

There is a plausibility to Mr. Morgan's views, especially when we consider that the southern Mound-builders built their houses upon terraced pyramids, which were often arranged around an enclosed court. The Aztecs also built their palaces around an enclosed court, and placed their temples in sacred enclosures, making the terraced pyramid their typical structure. This is regarded by some as an evidence that the tribes of the southwest were all of the Malayan stock, and it is conjectured that possibly the style may have been introduced from the southeast of Asia. We may, at least, say that the style of architecture was entirely different from that which prevailed among the wild tribes of the north, for these never built their houses in terraces and rarely made their villages to enclose a court, the majority of them having rude tents, which were built on the ground and placed in rows, sometimes with a stockade surrounding them

Still, Mr. Cosmos Mindeleff says the pueblo architecture was intimately connected with and dependent upon the country where its remains are found. The limits of this country are coincident with the boundaries of the plateau region—so much so that a map of the latter would serve to show the former.

Tsegi is almost in the center of this country. The ruins show several periods of occupation, which may be classified as follows: 1. Old villages on open sites. 2. Home villages on bottom lands. 3. Villages located for defense. 4. Cliff outlooks. By the study of the cliff ruins we are led to the conclusion that they are connected with and inhabited at the same time as a number of larger home villages.*

These structures are typical of all the aboriginal houses in New Mexico. They show two principal features—the terraced form of architecture, with the housetops as the social gathering places of the inmates, and a closed ground story for safety. Every house is, therefore, a fortress. Mr. Mindeleff says of the ceremonials connected with the house-building: The material having been accumulated, the builder goes to the village chief, who prepares for him four small eagle feathers. The chief ties a short cotton string to the stem of each, sprinkles them with votive meal, and breathes upon them his prayers for the welfare of the proposed house and its occupants. These feathers are called Nakwakwoci, a term meaning a breathed prayer, and the prayers are addressed to Masauwu, the sun, and to other deities concerned in houselife. These feathers are placed at the four corners of the house and a large stone is laid over each of them. The builder then decides where the door is to be located, and marks the place by setting some food on each side of it; he then passes around the site from right to left, sprinkling piki crumbs and other particles of food, mixed with native tobacco, along the lines to be occupied by the walls. As he sprinkles this offering he sings to the sun his Kitdauwi, house song: "Si-ai, a-hi, si-ai, a-hai." The meaning of these words the people have now forgotten. The house being completed, the builder prepares four feathers and ties them to a short piece of willow, the end of

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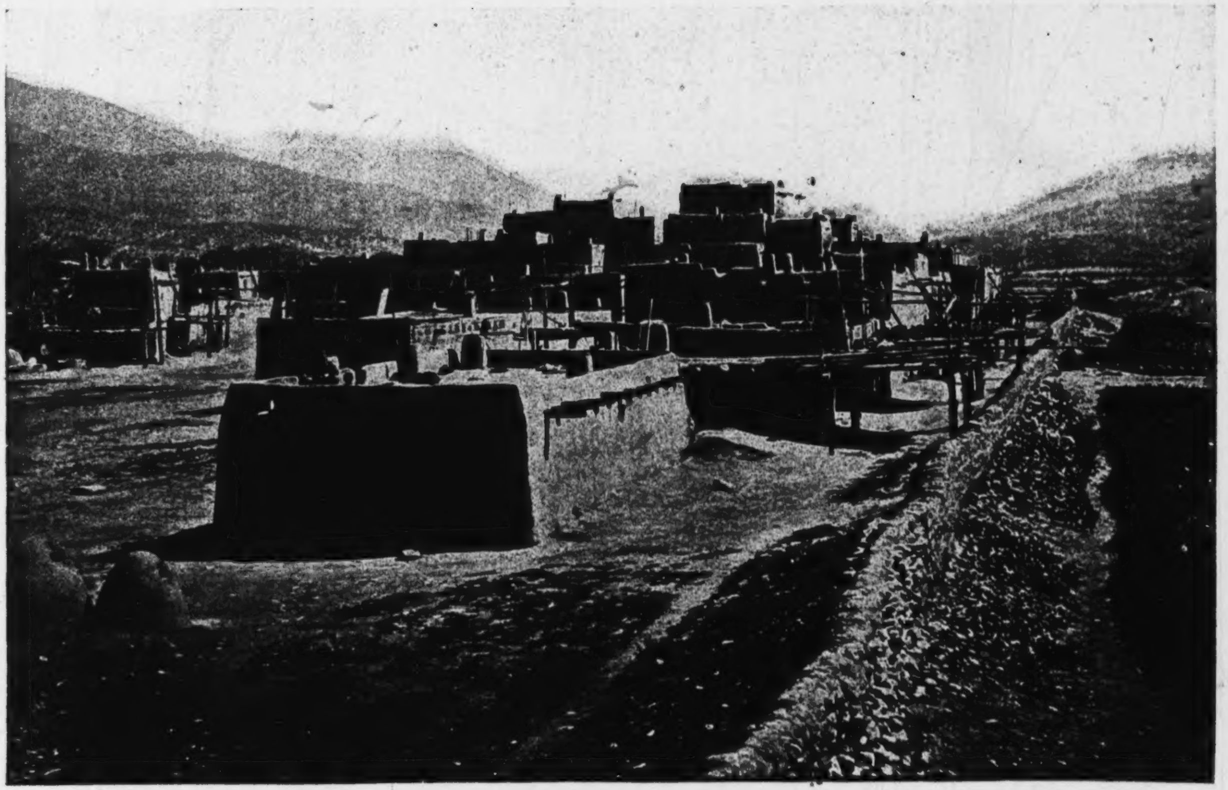
*See American Anthropologist, Vol. VIII, No. 2, p 153.



TAOS—SHOWING WALL. BALCONIES, TERRACES, AND ROOF.

HANO, ONE OF THE TUSAYAN PUEBLOS.

of which is inserted over one of the central roof houses. The feathers are renewed every year, at a feast celebrated in December, when the sun begins to turn northward, thus showing that the history of the house was to be connected with the heavens and the course of the sun.

This dedication of a house, by placing feathers under the rafters, among the Tusayans, is paralleled by the dedication of the kivas among the ancient inhabitants on the Chaco. The kiva was always characterized by a circular wall forming a room, the roof of which is usually below the level of the surrounding rooms. At the base of this wall is a bench of solid masonry, from two to four feet high, which projects from two to three feet into the room. On the bench are six piers, or blocks of masonry, which represent the pillars of the sky. The niches between the piers and the projecting ledge represent the circuit of the earth. The orifice in the centre of the kiva, called the sipapuh, represents the "place of emergence."

A recent discovery by Mr. George H. Pepper in the Pueblo Bonito, shows that there were ceremonial deposits in the kivas. These deposits were placed on the top of the pillars and below the roof beams. In this case, they consisted of turquoise, pieces of crude shell, and turquoise in the matrix. Materials of this nature are generally considered to be sacrifices. They were placed exactly under the six points, where the lowest roof beams rested on the pillars, and literally supported the entire roof, and so must have had a peculiar significance.*

The kivas of the Cliff-Dwellers, according to Mr. Nordenskjold, were also constructed in the same way, and it is probable that offerings were made to the divinities, at the time that they were constructed. We see, then, from these customs, that there was a unity among all the tribes of the Pueblos and of the Cliff-Dwellers, and that all were organized into tribes and gentes, which had the same mode of government, the same religious customs, and probably the same mythology.

IV. We turn now to the different periods which are represented by the Cliff-Dwellers and Pueblos alike. These are somewhat difficult to make out, but, judging from the traditions, the relics, the ruins, the pictographs, and other tokens, we should divide them, as follows: First, the period in which the earliest pueblos were erected, a period which is marked by the very rude cliff-dwellings. To this period we would ascribe the cliff-dwellings near the Red Rocks, which are given the names of Palatki, Halonka, and Bear House. These are the rudest specimens which have been discovered, though they have the bulging bow-window fronts which characterize some of the cliff-dwellings farther north, especially that at Monarch's Cave in Utah. To this period, also, we ascribe the boulder sites and the irrigating ditches. The ancient walls, which are found in the cliff-dwellings of the San Juan, where there are no irrigating ditches, also belong to this period.

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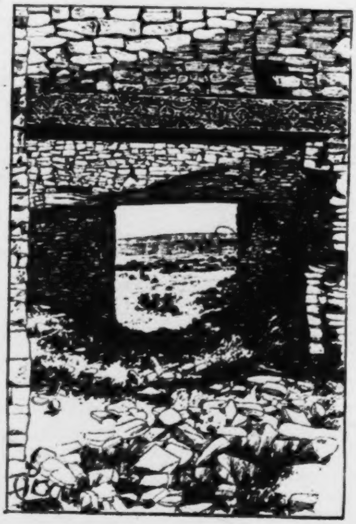
* See "Monumental Records," Vol. I., No. 1, page 5.

The second period was the one in which the wild tribes invaded the Pueblo, territory and drove those who were dwelling in the pueblos from their homes, and compelled them to build their houses high up in the cliffs, and compelled others to construct walls about their pueblos. This was the Cliff-Dwellers' period, for in it most of the cliff-dwellings were erected. It preceded the advent of the Spaniards.

The third period began after the advent of the Spaniards, and continued up to the war with Mexico, and was marked by the appearance of a large number of cathedrals and churches, and by the concentration of the pueblos into prominent centres. This was a period in which many of the pueblos went to ruins; among them those east of the Rio Grande, Pecos, and the three pueblos which have been called "the cities that were forgotten," namely, Tabira, Cuaras, and Abo. Of these, Tabira was the most prominent. Here was a cathedral, which is now in ruins, but which was, at one time, a fine specimen of architecture. The entrance, with the carved lintel, is represented in the cut. The place was known as "Gran Quivira." It was one of the larger pueblos and had, perhaps, 1,500 inhabitants. A long, narrow array of three- and four-storied terraced houses, facing each other across the valley; six circular estufas, partly subteranean, were characteristic of it. These pueblos went to ruins under the attacks of the Apaches, combined with the oppression of the priests. There were three great churches, extensive convents, large reservoirs, rimmed with stone, to catch and hold the rain and snow; but the plain was an utter desert, and the cities were abandoned.



CHURCH AT TABIRA.

The fourth and last period has been marked by the erection of many modern pueblos, and by the introduction of modern furniture into the houses, by the change of the dress and the appearance of the Pueblos themselves.

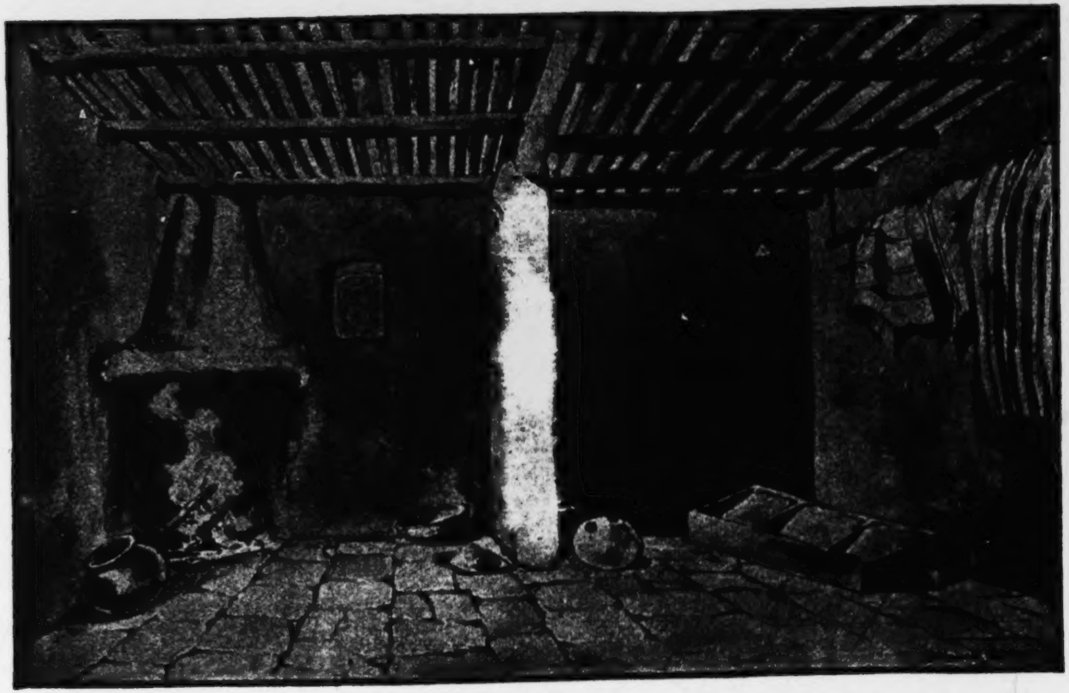
The plates show the structures which belong to these different periods. One of these represents Taos, with its ancient walls, irrigating ditches; its terraced buildings, erected in the pyramidal form—one on either side of the stream; a pueblo which probably was erected in prehistoric times. Another plate represents Hano, one of the seven pueblos of Tusayan, with its courts, its kiva, its terrace, flat roofs, and the mesa adjoining. This is a modern structure, and is not as well built as the ancient. The third plate represents the interior of a Tusayan house, with its modern-shaped fire-place, with chimney and chimney-hood; its stone floor; its ollas, or water-jars, which were always kept filled; its pottery bowls; also, its metates, or mills for grinding meal. The woven blankets, thrown over the pole, are evidently modern, as are also the windows and other furnishings. Another plate represents a modern room in a Zuni pueblo, with a door and window and chimney and couch, all of which were evidently borrowed from white men of recent date. The dress of the women is partly modern and partly ancient. The style of leaving one shoulder out is ancient, but the drapery is otherwise modern. The bowls and jars are of modern construction. The two plates represent the latest period.

The history of these different periods can not be fully made out, though there are traditions which connect them closely. There seem to have been movements among the tribes before the advent of the Spaniards. The most of them were caused by the incursions of the wild tribes, especially the Apaches. This is illustrated by the map which was prepared by Mr. Oscar Loew, and which represents the pueblo region, with the tribes distributed according to their languages, and the tribal boundaries drawn from such data as could be gained. Another map, prepared by Major Powell and published in the Second Annual Report of the Bureau of Ethnology, represents several classes of structures, namely, the inhabited, abandoned, and ruined pueblos, cavate houses, cliff houses, and towers. Both maps show that the Pueblos once inhabited the entire region between the Colorado on the west and the Rio Grande on the east; the Rio San Juan on the north and the Gila on the south, and that they then had entire possession of the territory. They show that the tribes on the northern and southern borders were driven toward the centre, and that the abandoned territory was occupied by the various wild tribes, such as the Apaches, Comanches, Utes, etc. Most of the pueblos were left to go to ruins.

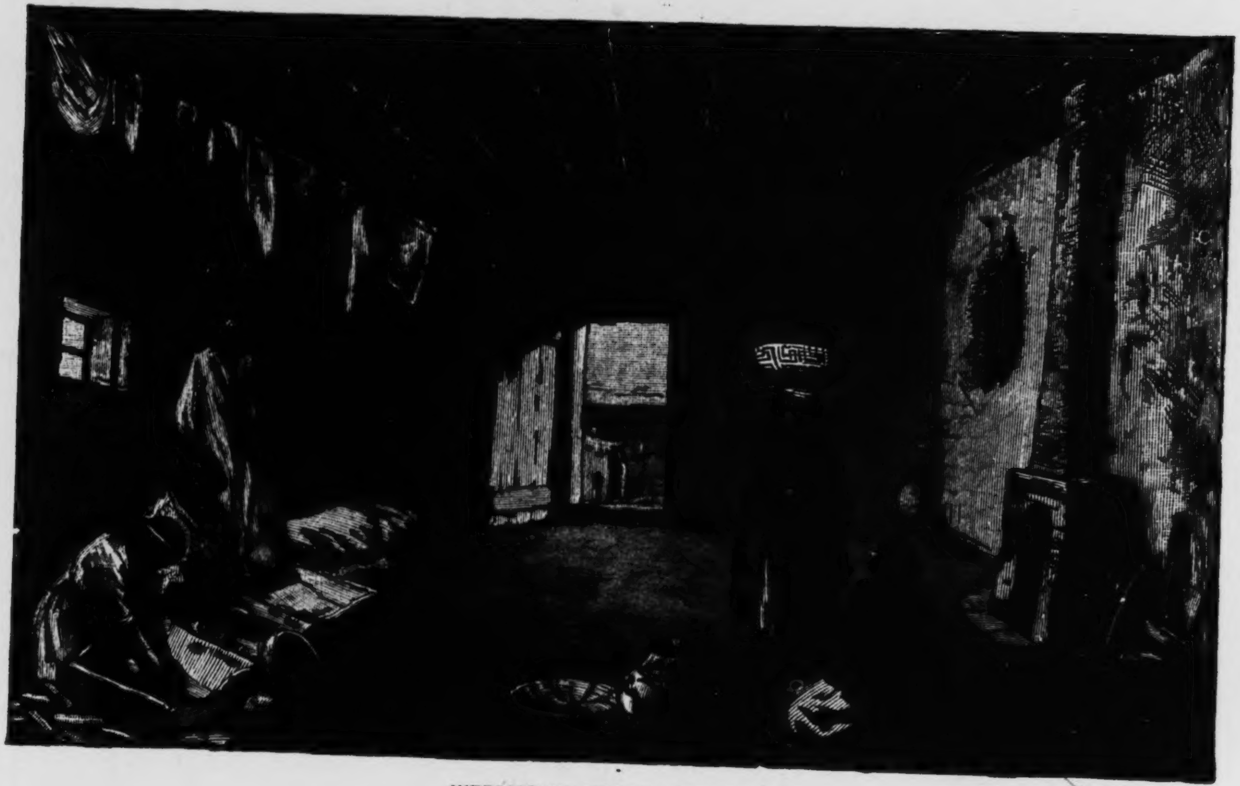
Traditions show that in prehistoric times the tribes moved from one part of the territory to the other, and it is a singular fact that the inhabited pueblos are all found on the route which was taken by the Spaniards on their first advent in 1540, and that all of the region surrounding, is without any tribal division, and marked only by the sites of ruins, though, if we take the ruins in evidence, we might construct a map which would show the location of other tribes; those on the Chaco indicating the habitat of one tribe; those on the San Juan, of another; those on the Rio de Chelly, of still another. It is probable that the pueblos of the Tusayans were the last resort for these tribes, when they were driven out, as they were situated in the centre and were secure from invasion because of their location upon the mesas.

It appears that their clans were mingled with those of the Tusayans and occupied apartments in the Tusayan villages. This is shown by a map which has been prepared by Mr. Mindeleff, from information furnished by Mr. A. L. Stephens. He says:

> In the older and more symmetrical examples there was doubless some effort to distribute the various gentes, or, at least, the phratries, in definite quarters of the village, as stated traditionally. At the present day, however, there is little trace of such localization. In the case of Oraibi, the largest of the Tusayan villages, Mr. Stephens has with great care and patience ascertained the distribution of the various gentes in the village. The only trace of a traditional village plan, or arrangement of contiguous houses, is found in a meager mention in some of the traditions, that rows of houses were built to enclose the court and to form an appropriate place for the public dances and processions of masked dancers. No definite ground-plan, however, is ascribed to these traditional court enclosing houses, although at one period in the evolution of this defensive type of architecture they must have partaken somewhat of the symmetrical grouping found on the Rio Chaco and elsewhere.
>
> The Zunis and the Tusayans belong to distinct linguistic stocks, but they are not so very closely related. The migrations of the Tusayan clans, as described in the legends, were slow and tedious. While they pursued their wanderings and awaited the favorable omens of the gods, they halted at places on their route during a certain number of "plantings," always building the characteristic stone pueblos. The tribe to-day seems to be made up of a confederacy of many enfeebled remmants of independent phratries and groups, once more numerous and powerful. The members of each phratry have their own store of traditions relating to the wanderings of their own ancestors, which differ from those of other clans, and refer to villages successively built and occupied by them.
>
> The architectural and traditional evidence establishes a continuity of descent from the ancient Pueblos to those of the present day. The adaptation of the architecture to the peculiar environment indicates that it has long been practiced under the same conditions that now prevail. The pueblo population was probably subjected to the necessity of defence throughout the whole period of their occupation of the territory. They were stimulated by the difficult conditions of their environment, and by constant necessity for protection against their neighbors, to make the best use of the materials about them; but the various steps or stages of growth from the primitive conical lodge to the culmination in the large communal village of many-storied, terraced buildings, can be traced in the ruins. The results attest the patience and industry of the ancient builders, but the work does not display great skill in construction, or in the preparation of material. The appearance depended on the careful selection and arrangement of the fragments in the walls, rather than in any finished masonry. This is more noticeable in the Chaco ruins than in modern pueblos. Here the walls and the rooms were wrought to a high degree of surface finish.



INTERIOR OF A MODERN TUSAYAN ROOM.



INTERIOR OF MODERN ZUNI ROOM.

# CHAPTER X.

CONTINUED.

## ANCIENT AND MODERN PUEBLOS COMPARED.

We now turn to the comparison of the architecture of the ancient and modern pueblos.

We have shown, elsewhere, that there were several districts, each one of which was characterized by a different style of building. Those of the central districts on the Zuni and Chaco rivers, were erected in terraces around a court with the apartments close together, after the "honey-comb" pattern; those in the district on the Rio Gila were separate buildings, scattered over a level valley along the side of irrigating canals, with one large building, which might be called a "castle" or "citadel" in the centre of the village; those situated to the southeast presented a combination of the "cavate house" and the pueblo, as there are many caves in this region and near them the ruins of ancient pueblos. On the Rio Grande the style was to build in terraces around the four sides of a court, or on two sides of a stream, with the stream draining the court. On the Rio San Juan there was a great diversity of style; some of the ruined buildings are in the shape of terraced pueblos, built after the "honey-comb" pattern; others are separate buildings, grouped together, but making a 'straggling village'; others are cavate houses with towers above the caves; the typical structures of this region are the cliff-dwellings or cliff villages, which were built into the sides of the cliffs, and so arranged that the court should be in the rear of the buildings and the towers in front of the buildings, the whole group or line of structures forming a compact village, which was made safe from attack by its situation, the houses being difficult of access.

The district on the Kanab and Colorado Rivers, and along the Grand Cañon, is according to Maj. Powell characterized by houses which were scattered over the region near springs and streams which could be used for irrigation, and were occupied during summer and were called rancherias; these were connected with a central pueblo, which was the permanent residence and capable of holding several thousand people. There was a district on the Sonora, in Mexico, in which the houses were built after the pattern of the Casa Grande, on platforms and in terraced pyramids.*

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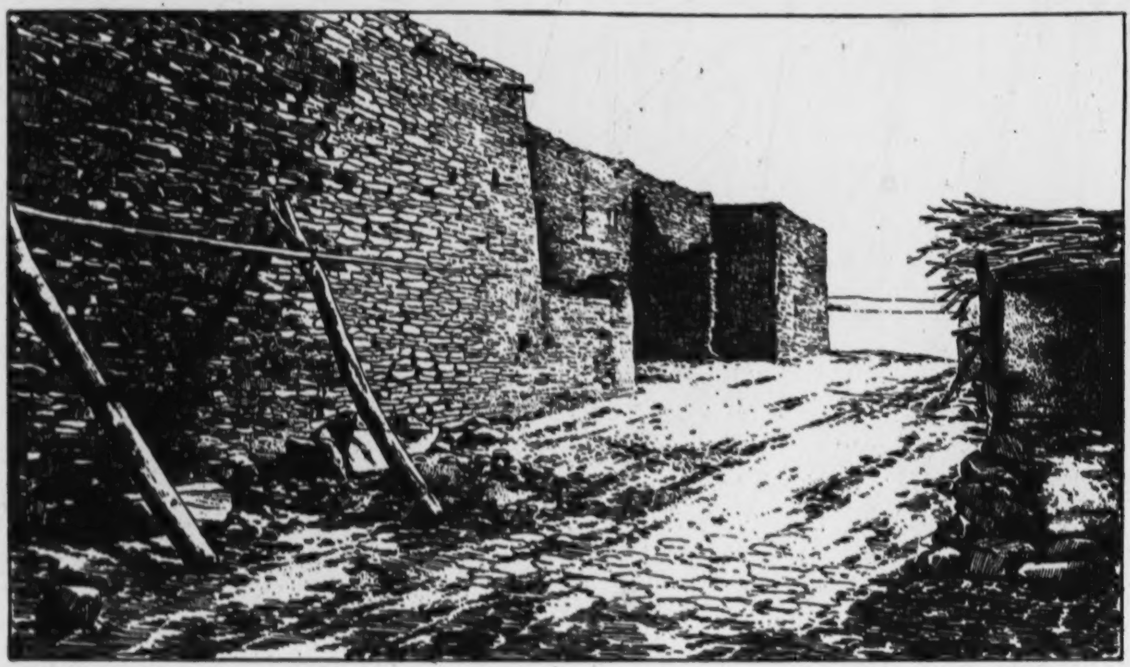
* See Chapter V, p. 65. Exploration of the Pueblo Territory.

This classification of the pueblos corresponds closely to that recognized by the Spaniards, as will be shown by the following quotation from Castaneda: "The name Chilticali, was given in former times to this place (Casa Grande), because the Friars found in the neighborhood a people who came from Cibola. The house was large and it seemed to have served as a fortress. Up to Cibola, which lies eighty leagues to the north, the country rises continually. The province of Cibola (Zuni) contains seven villages; the largest was called Muzaque; the houses of the country, ordinarily, consist of three and four stories, but at Muzaque some have as many as seven. Twenty leagues to the northwest is another province contaning seven villages (the Moqui villages); the inhabitants have the same manners, wear the same dress, and have the same religions as the inhabitants of Cibola. It is estimated that three or four thousand men are distributed among the villages of these two provinces. Tiguex lies to the northeast at a distance of forty leagues from Cibola; between these two provinces is the rock of (Acuco) Acoma. The province of Tiguex contains twelve villages situated on the banks of a great river. It is a valley about two leagues broad. It is bounded on the west by very high mountains covered with snow. Four villages are built at the foot of these mountains and three on the heights. Farther north lies the province of Quirix, which contains seven villages. Seven leagues to the northeast is the province of Hemes (Jemez), which contains the same number. Forty leagues in the same direction lies Acha (Chaco). Four leagues to the southeast is situated the province of Tutehaco, which contains eight villages."

The following survive some of them in modern style: Cibola seven villages; Tusayan seven; the Rock of Acuco one; Tiguex twelve; Tutehaco eight, reached by descending the river; Querix seven; among the Snowy mountains seven; Ximena three; Cicuye one; Hemes seven; Aquas Calientes three; Yunque six, on the mountain; Valladolid or Braba one; and Chia one. This makes seventy in all. Tiguex is a central point and Valladolid is the last village up the river to the northeast." The most of these villages have been identified: Cibola with Zuni, Tusayan with Moqui, Acuco with Acoma, Tiguex with Albuquerque, Tutehaco with Tutehaco, Quirix with Queres, Muzaque with Toyoalana, Cicuye with Laguna, Hemes with Jemez, Braba with Taos, Chia with Sia. The Cliff-dwellings in the Mesa Verde and the ruined buildings on the San Juan, and on the Rio de Chelley, do not seem to have been known to the Spaniards; at least, they are not mentioned.

A description of the village of Laguna, given by Castaneda, in 1540, will show to us what its style of architecture was at that time: "The village of Cicuye can muster about five hundred warriors, dreaded by all their neighbors. It is built on the top

MODERN FORM OF ROOFS OR TERRACES AT ORAIBI



A TUSAYAN PUEBLO SHOWING MODERN STYLE OF WALL of a rock and forms a great square, the centre of which is occupied by an open space containing the estufas. The houses have four stories, with terraced roofs, all of the same height, on which one can make a circuit of the whole village without finding a street to bar one's progress. On the first two stories there are corridors, like balconies, on which you may walk around the village and under which you may find shelter. The houses have no doors in the basement; the balconies, which are on the inside of the village, are reached by ladders, which may be drawn up. It is on these balconies, which take the place of streets, that all the doors open by which entrance is gained to the houses. The houses that front on the plain, stand back to back with the others which look upon the court. The latter are the higher, a circumstance of great service in time of war. The village is further surrounded by a rather low wall. There is a spring, which might, however, be turned off from the village."

As to the manner of building the pueblos, Castaneda says: "The houses are built in common; it is the women that mix the mortar and erect the walls; the men bring the timbers and do the joinery. They have no lime, but have a mixture of ashes, earth and charcoal, which replaces it very well, for though they build their houses to the height of four stories, the walls are no more than one-half of a fathom thick. They collect great heaps of thyme and rushes, and set them on fire; when this mass is reduced to ashes and charcoal, they cast a great quantity of earth and water upon it and mix the whole together; they coat the whole wall with this mixture, so it bears no little resemblance to a structure of masonry." As to the estufas, Castaneda says; "They lie underground in the court yards of the village; some of them are square and some of them round; the roof is supported by pillars made of pine trunks. I have seen estufas of twelve pillars each, of two fathoms in circumference, but usually there are only four. They are paved with large, polished stones, like baths in Europe: In the centre is a hearth on which a fire burns, and a handful of thyme is now and then thrown on the fire; this is enough to keep up the warmth, so that one feels as if in a bath; the roof is on a level with the ground. The houses belong to the women, the estufas to the men."

There are traditions among the Tusayans which make mention of all of these pueblos, and show the migrations which took place towards the central province, thus giving a history of the entire region. These traditions have been gathered by Mr. A. M. Stephen. The following is the summary of them, with the names of the totems; The Snake people and the Bear people came from the north by way of the Rio de Chelley; the Horn people from the Rio Grande, also by way of the Rio de Chelley; the Squash and Sun people from the red land of the west, by way of the Colorado Chiquito; the Water people from the far south, by way of the Little Colorado, where they had irrigating canals; the Asa people came from Rio Chama, by way of San Domingo, Laguna, Acoma and Zuni; the Hano people from the Rio Grande, by the river de Chelley, and settled at Hano; the Payup-ki people came from the north, from the San Juan river. They first moved to the Jemez mountains where they remained until the Spanish Massacre in 1680; they then moved west to Ft. Wingate, and so on, to the Tusayans, and settled at Pay-up-ki.

This same division of the Pueblo territory is exhibited by the languages used by the surviving tribes

According to F. W. Hodge the Pueblo languages are divided into five stocks, as follows: (1) Tanoan, including Tano, Tewa, Tiwa, Jemez and Piro, all situated on the Rio Grande. (2) Keresan, these occupy the Pueblos of Acoma, Laguna, Sia, Santa Anna, San Felipe, Santo Domingo and Cochiti Cochiti. (3) The Zunian stock, which occupy the Pueblos of Zuni. (4) The Shoshonean stock occupy the Tusayan towns of Walpi, Mashongnavi, Shipaulovi, Shumopavi, Oraibi. (5) The Pimas occupied the Rio Gila. (6) The Papagoes occupied the province of Sonora, Mexico.

These records confirm the traditions preserved by the Indians and show that there were different tribes in the pueblo territory; that they came from different directions, were of different origin, settled in different districts and had a separate and distinct tribal history — a history which we may read in the architecture, art, and other tokens of the district.

It is indeed a favorable field for one who is given to theorizing to make out a history of the progress of architecture, and to show that the caves were the first abodes, after them the cliff-dwellings, after the cliff dwellings, the fortresses on the Mesas, after these the "great houses" or pueblos in the valleys, the pattern being drawn from the shape of the Mesas, or if this fails, to advance another theory. The primeval abode was the hut, the shape of which is preserved in the solitary houses; the next stage is marked by the clusters of huts in a straggling village; the third by compacting the apartments into one great house.

These theories are very plausible, but history does not confirm them, for the fact is, the caves were inhabited quite as late as the pueblos, by tribes whose names and migrations are known. The Cliff-dwellings were erected after the ruined pueblos in the same region, and by a people who once occupied the ruins, but were compelled to leave them and resort to the cliffs for defence.

The pueblos of the central district were the final resort of the tribes, who built both the Cliff-dwellings and pueblos, but were

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*It may be difficult to fix upon the boundaries of these provinces, yet if we examine the ruins which predominate, we may not only decide as to the tribal habitat but even learn much of the tribal history.

driven by the Apaches and other wild tribes from their ancient homes and compelled to concentrate their settlements here, for the sake of defense.

There are, indeed, great similarities between the structures of the different districts, for all contain the same elements, meet the same necessities and seem to have been erected by a people of the same grade of advancement. Yet there are differences enough to show that the people were divided into tribes, and that each tribe had its own ancient habitat, and left in its habitat those tokens by which we may recognize them as plainly as if they were still living and appeared before us in their usual costumes; and speaking their original languages and were practicing their tribal customs. This may seem to be a strong statement, yet if the science of archæology as distinguished from ethnology is worth anything, it ought to enable us to travel through such a region as this, and learn the character and the condition of the people as clearly as we could if we were in the midst of living tribes. We do not need to confine ourselves to the architecture of the region, for there are many other tokens, such as the different specimens of pottery, the various relics in stone, bone and wood, textile fabrics, occasionally idols and images, skulls and human remains, and what is more important the petroglyphs[1] or rock inscriptions which contain the tribal emblems or clan totems. All of these exhibit the tribal divisions. While there was a similar mode of life, a similar grade of society, a similar tribal organization, there are evidences that the different tribes inhabited the river valleys and developed styles of architecture peculiar to themselves.

It may be well, then, for us to take these ancient pueblos and make them our special study,[2] for by this means we shall be able to trace the tribal history back to pre-historic times.

There may have been a succession of population in each province, some of them having been lower, others higher, in the scale of progress, but in many of the provinces we find that the last to occupy the region were the lowest, the wild tribes such as the Pimas[3] Navajoes, Apaches, having succeeded those who were sedentary in their habits and more advanced in their civilization. It is the middle period of occupation which most interests us, for in this period all of the elements of Pueblo life appeared.

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[1] The Petroglyphs of the different provinces seem to differ, as will be seen from examining descriptions given by W. H. Holmes, Dr Washington Matthews and others. The pottery found in the different river valleys has diverse patterns and material, according to its age, the black and white, which is generally considered the oldest, being found only in certain exceptional districts.

[2] The following are the names which have been given to the different buildings to describe their style, each name showing the characteristic of the architecture in the different provinces: (1) The great house, of the honeycomb pattern, is illustrated by the Zuni Pueblos, but prevailed throughout the entire region. (2) The "citadel" pattern is illustrated by the ruins of Casa Grande on the Gila, Casas Grandes, in Sonora, Mexico.

Some have maintained that the Pimas are the survivors of the people who built Casa Grande and the Navajoes are the survivors of those who built the Cliff dwellings, but the contrast between the rude tents which they occupy and the stone buildings seems to controvert it.

The analysis of the architecture of this period reveals certain features[1] which are common throughout the entire region, thus making it probable that there was a growth and development of what might be called the Pueblo style entirely separate and distinct from every other. Yet it was a growth which came from and was best adapted to the domestic life, the tribal organization and the peculiar customs of each tribe.

It is everywhere recorded that the "house" belonged to the women but the Kivas belonged to the men. The men dwelt apart from the women. As a result we find that the houses were always arranged with the domestic apartments closely grouped and compacted, the security and convenience of the

Fig. 1. VIEW OF MASHOGNAVI AND SHUPOLAVI

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(3) The "two house" pattern is illustrated by the Pueblo Taos and the ruin on Animas River

The "two house" pattern may have been used for the two parts of a "phratry" as has been suggested by Walter J. Fewkes, the two sections of the Cliff-houseon the Rio Verde, having been used for that purpose.

(4) The "Cliff house" pattern is illustrated by ruins found on the Mancos, Rio de Chelley and the Rio Verde in Arizona.

(5) The "cavate house" is represented by specimens described by Mr. W. H. Holmes, on the San Juan, and by Major Powell and others as on the Rio Dolores and on the Rio Grande.

(6) The "small house" pattern is illustrated by the solitary houses, numerous lodgings, situated mostly among the mountains.

(7) "Straggling villages" is a term applied to various sites wherever the houses are scattered.

(8) The "boulder sites" are found mainly on the Rio Verde near ancient Acequias. These, however, are not characteristic of any tribe or province 9 "Round towns" are found in ruins in the Moqui and Zuni territory.

[1] These features were such as pertained to village life everywhere, for the villages in the Mississippi valley belonging to Mound-builders and Indians, had courts, estufas, storehouses, towers or look-out stations, occasionally terraced pyramids and apartments or dwelling places, clustered close together, very much as the Pueblos did. They were also surrounded by garden beds and reservoirs.

families being the chief object. The Kiva usually adjoined the Pueblo, being placed in the courts.

Among the Cliff dwellers, as we have seen, the domestic apartments, were placed high up on the cliffs, and the Kivas or assembly places and towers, were placed in the valley below. In the case of the Cave-dwellers, they were on the summit of the Mesas, above the caves, but the principle was the same, still the Kiva was a part of the village, but was for the men.

The store houses were always close by the domestic apartments. In the Pueblos they were in the lower story and were always dark, and reached through trap-doors in the apartments.

In the Cavate houses the store-rooms were at the side of the living rooms, in apartments which were excavated farther into the cliff, and were consequently dark and unpleasant. In the cliff houses the store-rooms were placed on a ledge above the living rooms, but sometimes were scattered along the cliffs in the little recesses, pockets, cubby holes, which could be found in the vicinity of the house.

Another peculiarity of the ancient pueblo was that it represented a peculiar stage of advancement, that stage in which architecture began to be developed and in which the rudiments of art also appeared. The houses which were erected contained all the architectural elements, found in any modern dwelling, such as walls, doorways, windows, roofs, dormitories and kitchens. and in this respect would differ from the wild tribes who dwelt only in tents or wigwams.[1] They differed, however, from one another in the finish of the walls, the shape of the doors, the size and arrangement of the rooms, in the site chosen, and in the material[2] used, each district presenting pueblos,[3] which, in these respects, were peculiar, but in other respects, were similar.

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[1] The most common method was to erect a compact pueblo, in the valleys of the streams and near the fields placing the apartments close together and making the walls serve as a defense. there being no doors in the lower story, and the homes of the people were in the upper stories.

[2] The material from which the houses were built depended upon the character of the country surrounding, as Mr. Fewkes says, "men of the same culture would build *adobe* houses in adobe plains in tufaceous they would burrow troglodytic caves; in the canons where there were extensive shelter caves they would build Cliff-houses, while upon the rocky mesas and in the mountain regions they would naturally build stone houses, taking the stone from the cliffs and making the terraces to resemble those of the mesas." This would show that the people were greatly under the influence of their environments but does not refute the position that there were tribal lines or inherited qualities which can be recognized in the structures and art forms which remain.

In reference to the pottery we might quote the testimony of Nordenskjold, Holmes and others as to the different kinds of pottery found in the different provinces. The black and white pottery is very common in the northern and western provinces and among the older ruins, but the red pottery is in the central provinces and among the more modern pueblos.

[3] The pueblo structures were confined to the Great Plateau. All the structures outside of the bounds having a different pattern and different material, those at the north and west being merely huts built of wood and bark; those at the south being constructed of stone. built up as solid pyramids without any chambers in them, the houses and temples having been placed upon the summit; those at the east being mainly wigwams of bark and skin. or huts covered with earth the Mound-builders houses having been erected on earth pyramids.

Buildings made from adobe were discovered by W. K. Moorehead in Monarch's Cave, near Cotton Wood, in Utah. constructed exactly the same as those on the Gila with posts and wattle-work. Adobe walls appeared in some of the buildings on the Rio Grande.

Specimens of the different styles[1] are given in the cuts: Fig 1 illustrating the location; Fig. 2 the finish of the walls; Fig. 3 the shape of some of the buildings; Fig. 4 the shape of the rooms; Figs. 5-6 the shapes of the doors and windows; Fig. 7 the location of the estufas; Figs. 8-9 the location of the towers and other buildings.

The fashion of the doorways varied in the different provinces, for those on the Gila had sloping sides and narrow lintels, while those of the Cliff-dwellers were built in the stepped fashion, the sides notched, the lintels, much broader than the sills; those on the Rio Grande were sometims square and sometimes stepped.

There were courts, streets, passageways, gates, and even balconies, terraces and circumvallations, in nearly all of the villages, but the arrangement of these was dependent upon the character of the ground on which the building stood. As to the location of the villages this would be decided by circumstances.

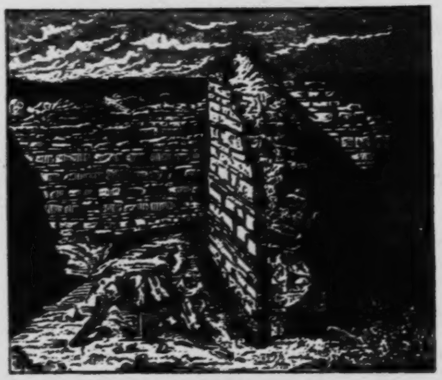

FIG. 2. ANCIENT RUINS ON THE ANIMAS *

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[1] The style represented by Casa Grande. on the Gila, is found in Casas Grandes in Chihuahua, these being extreme points at which the Adobe structures are found; the Cavate style is represented by the houses on the Salado on the Rio Verde and on the Rio Grande near Santa Clara, as well as in Sonora, in Mexico. The small house pattern is found mainly among the mountains, specimens being numerous near the Rio Grande and near the Rio Colorado, some of them being built of *stone* and others of *lava blocks*.

* Lieut. Rogers Birnie says of these ruins: "We found what had once been quite a town, with two main buildings (phratry dwellings). One of them was rectangular with a small court flanked on either side by two circular rooms. two at the corners, three parallel with the longer side of the building. the remainder of the building divided into rectangular apartments, three stories high, a wall, quite perfect. standing in places 25 feet in height. Entering a room in ruins it was found connected with an interior one by a doorway 4 ft. 4 in. high and 2 ft. and 4 in. wide, cased with nicely dressed sandstone about the size of an ordinary brick; the lintel was composed of small round pieces of wood, the walls were 2 ft. 5 in. thick marked with crosses and inscriptions. The interior room was 14 ft. by 6 ft. 4 in. In the center of the building was a rectangular shaft 8 ft. by 6 ft.

The other main building is about 200 yards to the west of this and about 200 feet long and regularly supported on the exterior by buttresses. Above the buttresses the exterior wall shows some very pretty architectural designs. There is seen a projecting cornice, plain. composed of three or four courses of very thin reddish sand-stone, and again a course of nearly white stone, perhaps a foot thick, then other courses of different shades and thicknesses, alternate.

The entire masonry is built of courses of different thicknesses of stone of different colors.

There were certain necessities which must be met, but in an arid region like this, were difficult to provide for. As a result, great sagacity was exercised in the choice of the location and great skill in over-coming the difficulties. The villages were placed near springs where there was an abundant supply of water and not very distant from the forests where wood could be obtained.

Near the villages were fertile bottom lands or arroyas, which could be irrigated, the water for this being taken from the mesas or from the reservoirs above, or from the streams and rivers below the villages; canals or acequias were always provided for directing and controlling the water; garden beds sometimes took the place of acequias and answered the same purpose.

There would naturally be some provision for defense as the people were surrounded by hostile tribes and were not always friendly to one another.

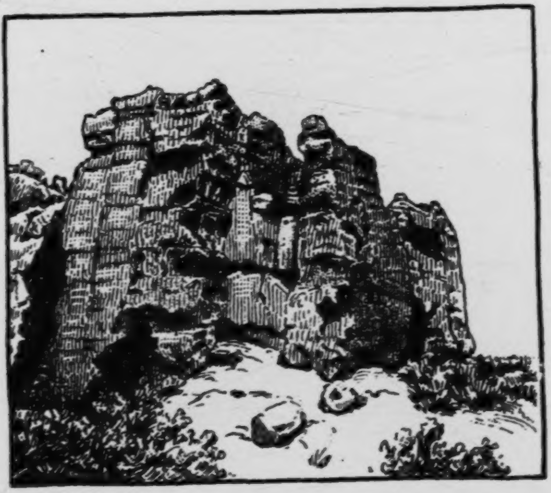

FIG. 3. VIEW OF CASA GRANDE

It has been maintained by some that to build a separate fortress was beyond the reach of a people of this stage of advancement, but the facts are contrary to the theory.[1]

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[1] Bancroft states "that at Casas Grandes, in Chihuahua, there was a fortress built of great stones as large as mill-stones. The beams of the roof were pine well worked. In the center was a mound for the purpose of keeping guard and watching the enemy. It was located two leagues away, on the top of a high cliff, and was designed as a watch tower or central station." His account is taken from a writer in *Album Mexicano*, who visited Casas Grandes in 1842. The ruin Cassas Grandes was located upon a finely chosen site commanding a broad view of the San Maguel River. The walls in some parts were 5 feet thick and from 5 to 40 feet high, composed of sun-dried bricks. See Bancroft's Native Races, Vol. V, page 606.

Walter J. Fewkes speaks of fortified hill-tops in the neighborhood of Red Rocks, also among the mountains of Arizona.

McGee speaks of one in the Magdalena valley in Sonora, Mexico.

There were several ways of defending the villages. One was to place the villages or pueblos on mesas that were difficult of access; another was to place them in the sides of the cliff making the height a source or safety; another was to build a citadel in the center of the village and surround it by walls and make it serve as a refuge for the people in time of attack. In a few cases there were walled enclosures erected on the summits of the isolated mesas and these were used, both for lookouts and fortresses.

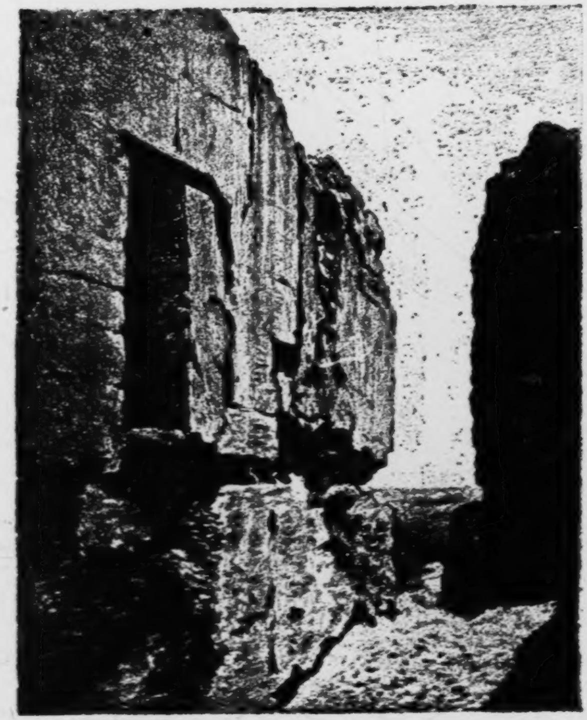

Fig. 4. EAST WALL OF NORTH ROOM

That there were migrations among the tribes,[1] in pre-historic times, is shown by the fact that the houses built in the style peculiar to each province are found at a distance from the center, the houses of the Cliff-dwellers having been found as far away as the Red Rock on the Rio Verde. The houses similar to those on the Rio Grande are found as far west as the Hovenweep.

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[1] The question of kinship may be determined by the ruins which extend along certain lines, for if we can show connections at both ends of a line of habitation, we may draw inferences for the intermediaries. In this way the Cliff-dwellings at Red Rock on the Rio Verde and those on the Mancos, the citadels on the Gila and on the Sonora; the "great houses" at Zuni and on the San Juan, the two houses at Taos and at Quivira determined the tribal boundaries.

The survivors of the Pueblo tribes were found by the Spaniards in the central districts But by studying their traditions we may trace their migration routes, and identify their stopping places, and so learn the movements which have taken place, but the differences in the architecture are, in all such cases, far more significant than their resemblances for they show the previous tribal history and the tribal wanderings.

With these remarks we proceed to describe some of the specimens of ancient pueblos.

We begin with the ruins of Casa Grande on the Rio Gila. These were the first visited by the Spaniards, and have recently been visited by American explorers, and have become well known.

The following description, by Mr. J. W. Fewkes, will show the style of the building:

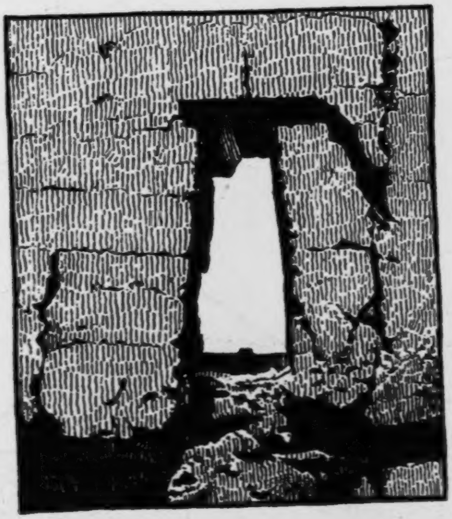

FIG. 5. NORTH WALL OF NORTH ROOM

"This venerable ruin, which is undoubtedly one of the best of its type in the United States, is of great interest in shedding light on the architecture of several of the ruined pueblos which are found in such numbers in the Valley of the Gila and Salt Rivers. The importance of its preservation from the hands of vandals and from decay led Mr. Hemingway and others, of Boston, to petition Congress for an appropriation for this purpose.[3] The petition was favorably acted upon. The ruin now stands in the midst of others, towering high above them. It is roofless, and not a stick of wood as large as one's arm remains in place in its walls. It is built of cubical adobe blocks several feet in dimensions. It did not stand alone originally, but there were other houses of the same massive construction near by. One of the best marked of these is a group of houses a few hundred feet north.

---

[3] The Government has made an appropriation, so that the building at Casa Grande will be preserved.

There are also others to the north-east; they are covered with fragments of pottery of ancient appearance, which show that they are on the sites of former buildings. At about equal distances from the four sides of the Casa Grande there are mounds, which indicate the existence of former walls, and seem to mark the edge of the pueblo, in the middle of which it once rose like an acropolis or citadel. As one approaches the ruin along the stage road from the side towards Florence, he is impressed with the solidity and massive character of the walls and the great simplicity of the structure, architecturally considered.

The fact that the walls of the middle chamber rise somewhat above those of the peripheral is evident long before one approaches the ruin; this puts a certain pyramidal outline to the pile. The orientation of the ruin corresponds to the cardinal points. From the plan it will be seen that the bounding walls of the ruin enclose five chambers, which fall in two groups, twin chambers, one at either end, and triplets between them; the north and south extend wholly across the building, their walls forming the eastern and the western sides of the building, the three chambers of the middle portion extend in a north and south direction across the whole building. All the chambers of both kinds have a rectangular form, and their angles, as a general thing, are carefully constructed right angles, though the vertical and horizontal lines are seldom perfectly straight. The north room occupies the whole northern end of the ruin, and has all the bounding walls of the lower stories almost entire; the greatest length of the room is from the east to the west. There are good evidences of at least two stories above the present level of the ground; the western wall of the room is pierced by a single circle and a rectangular window, two openings lead from the chamber into adjoining rooms,— one of them into the eastern chamber, the

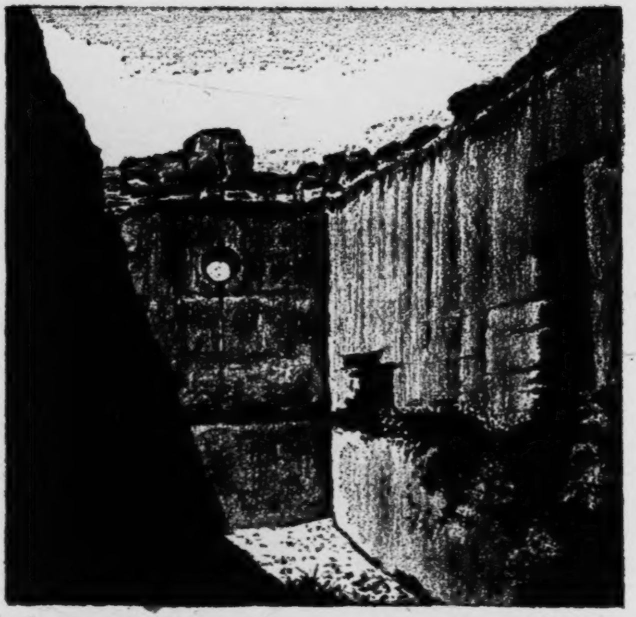

FIG. 8. SOUTH WALL OF NORTH ROOM

other into the western. The passage-way into the east room is situated on the second story, and is very conspicuous; its sides slope slightly, so that the width of the opening is wider at the base. There is no passage-way into the middle chamber. The west room of the middle triplet has a rectangular shape, its longest dimension being from north to south; it has an external entrance on the west side. There are indications of former passage-ways into chambers on either side, but no passage-way into the central chamber.

The eastern wall of this chamber is higher than the western, making the additional story of a central chamber. The east room, like that on the west, is longest in a north and south direction, and shows at least two stories above the present level. One can enter this room from the side, and from it can readily pass into the central chamber. This is in keeping with what is known as ceremonial enclosures. The central room was a sacred chamber, it probably had an entrance from the eastern room and not from the others; the exterior entrance of this room is from the east, and was one of the principal entrances into the building, it shows well defined lintel marks. A wide passage-way from the second story into the north room occupies about a fourth part of the north wall; the floor groove of the second story is pronounced. The south wall of the first story of this room is intact, there is a passage-way into the south room which has vertical jambs still well preserved, but its top has fallen in.

The south chamber of the ruin extends, like the north, across the whole end. As with the northern rooms, there are openings into the western and eastern rooms, and no signs of an entrance into the central chamber. The western wall of this room is pierced by a small, square window-like opening high up in the second story. From this side of the room one can, without difficulty, make out two stories and the remnants of a third; the line of holes in which the floor logs formerly fitted can be traced with ease.

The central chamber differs from the others, in that it shows the wall of an additional story on all four sides, and has but one entranee, and this is from the eastern side, the walls are very smooth, and apparently carefully polished. There are well preserved evidences of the flooring, and the smaller sticks, which formerly lay upon the same, are beautifully indicated by rows of small holes. The walls of the third story, on the western side, are pierced by three circular openings, about five inches in diameter,—they were possibly windows or possibly "look-outs." On the east wall there are three small round holes, on the north and south wall there are similar openings, one in each wall; these openings are, at times, placed as high as the head of a person standing on the floor of the third chamber. They appear to be a characteristic of the central room and of the third story."

It will be seen from the description and from the cuts given, that the style of architecture on the Gila was very different from that which prevailed among the pueblos of the Zunis or Tusayans and on the Rio Grande, and entirely different from that of the cliff-dwellings farther north, but resembled that found in the so-called "Castles" farther south, especially those in Sonora and in the north of Mexico; the ancient forms showing as great contrast as the modern structures.

As to the style of architecture which prevailed in the Cliff-Dwellers district, we have already shown that there was a great diversity of structures, but the most prominent style was that which is called the Cliff-Town or "Fortress" style; as proof of this we shall quote the discriptions given by those who have explored in the region.

The following is the language of Mr. Holmes:

The ruins of this region, like most others of the extreme west and south, are the remnants, in a great measure, of stone structures.

> As to situation, they may be classed very properly under three heads: (1), Lowlands, or Agricultural Settlements; (2), Cave Dwellings; and (3), Cliff-houses, or Fortresses.
>
> Those of the first class are chiefly on the river bottoms, in close proximity to water, in the very midst of the most fertile lands, and located without reference to security or means of defence. Those of the second are in the vicinity of agricultural lands, but built in excavations in low-bluff faces of the Middle Cretaceous shales The sites are chosen also, I imagine, with reference to security; while the situation of the cliff-houses is chosen with reference to security only. They are built high up in the steep and inaccessible cliffs, and have the least possible degree of convenience to field or water.
>
> As to use, the position, for the most part, determines that. The lowland ruins are the remains of agricultural settlements, built and occupied much as similar villages and dwellings are occupied by peaceable and unmolested peoples of to-day. The cave-dwellers, although they may have been of the same tribe and contemporaneous probably built with reference to their peaceable occupations as well as to defence but it is impossible to say whether or not they made these houses their constant dwelling-places. The cliff houses could only have been used as places of refuge and defence.
>
> During seasons of invasion and war, families were probably sent to them for security, while the warriors defended their property or went forth to battle; and one can readily imagine that when the hour of total defeat came, they served as a last resort for a disheartened and desperate people.[1]

The first group of ruins observed by Mr. Holmes was situated on the Rio La Plata, about twenty-five miles above its junction with the San Juan, and five miles south of the New Mexican line, and was an agricultural settlement or a "straggling village." See plate. He says:

> It is, doubtless, the remains of a large, irregular village, and stands on a low terrace, some twenty feet above the river bed, and near the center of a large, fertile valley. It will be seen by reference to the plate, which includes only the more important part of the town, that the buildings have been isolated, and, in a measure, independent of each other, differing in this respect from most of the groups of ruins farther south and west. . . . North of this are scattered a number of inferior ruins, the walls of which are not always distinctly marked.

In the center of the ruins is the circle (c) which encloses an estufa.

> South of the large circle is a mass of ruins, covering some 15,000 square feet, but so much reduced that nothing further could be determined than the fact that it had contained a large number of irregular apartments. Nowhere about the ruins are there any indications of defensive works, and the village, which is scattered over an area of over two miles in circuit, has no natural defences whatever.

Judging from the state of the ruins we conclude that this village was older than the pueblos on the Mac Elmo and at Aztec Springs, and much older than the towers on the Mac Elmo and Hovenweep.

The second group of ruins visited by Mr. Holmes contained a group of cave dwellings and towers, which were situated on the cliffs, but at a moderate height above the valley.[2]

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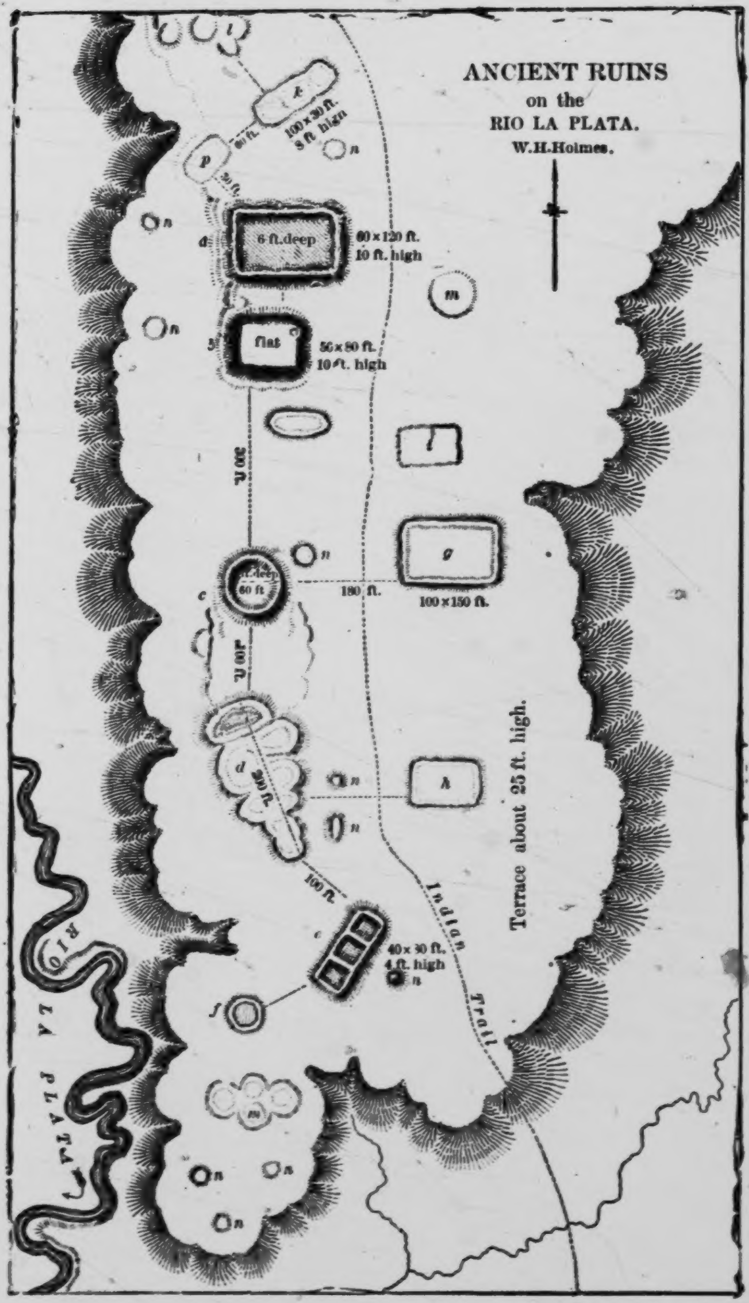
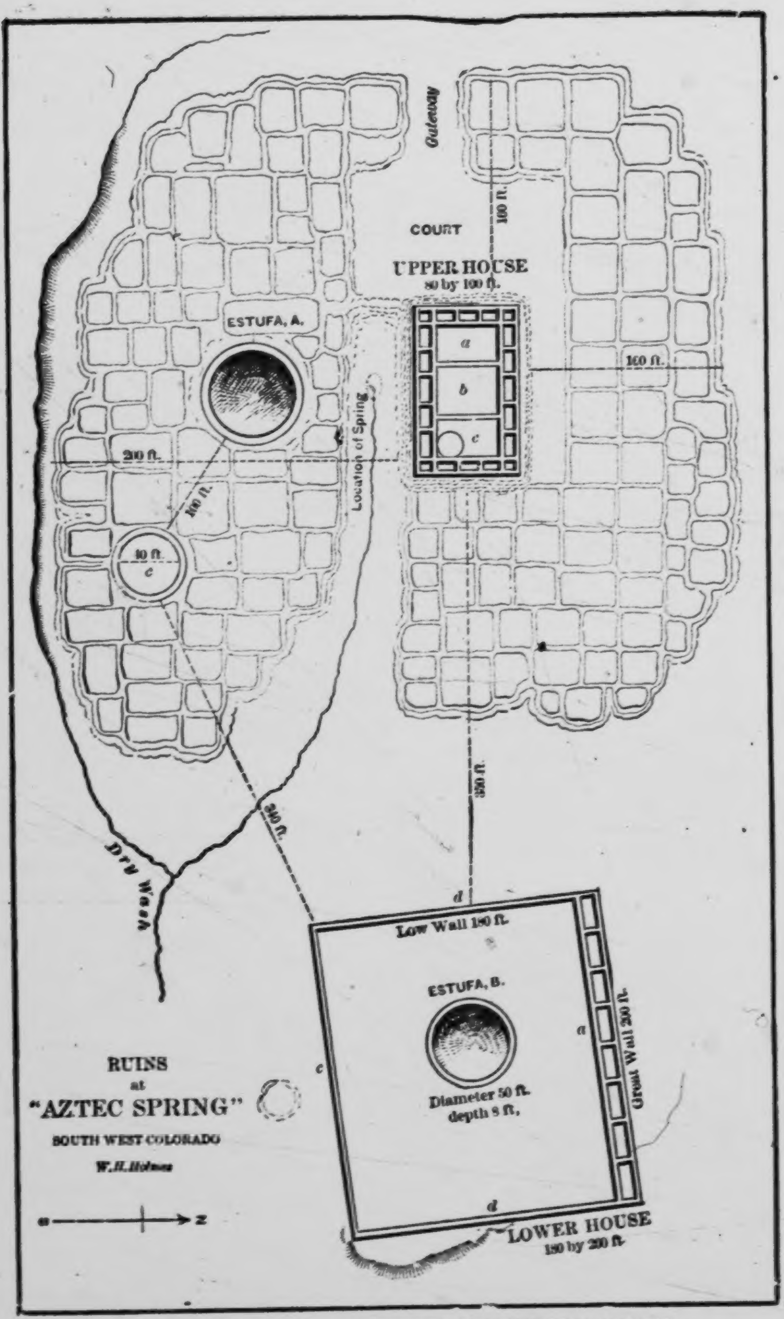
[1] The arrangement of the houses in these ruins remind us of the village of Walpi among the Tusayans. See fig. 12, p. 263.

[2] The testimony of most of the explorers of this region is to the effect that the ruins of the pueblos, built after the honey-comb pattern, were much older than the cliff-towns and cliff-fortresses, and that they were much more elaborate, and presented a more advanced type of architecture than the modern pueblos of the Zunis and Moquis.


ANCIENT RUINS
on the
RIO LA PLATA.
W.H.Holmes.
i
k
100 x 30 ft.
8 ft. high
80 ft.
p
30 ft.
n
a
6 ft. deep
60 x 120 ft.
10 ft. high
m
b
flat
56 x 80 ft.
10 ft. high
300 ft.
l
c
ft. deep
60 ft.
180 ft.
g
100 x 150 ft.
300 ft.
d
300 ft.
h
100 ft.
e
40 x 30 ft.
4 ft. high
f
Indian Trail
Terrace about 25 ft. high.
RIO LA PLATA

ANCIENT AGRICULTURAL VILLAGE


Gateway
COURT
160 ft.
UPPER HOUSE
80 by 100 ft.
ESTUFA, A.
a
b
c
160 ft.
Location of Spring
200 ft.
160 ft.
10 ft.
c
380 ft.
340 ft.
Dry Wash
d
Low Wall 180 ft.
ESTUFA, B.
Diameter 50 ft.
depth 8 ft.
a
Great Wall 200 ft.
c
d
LOWER HOUSE
180 by 200 ft.
RUINS
at
"AZTEC SPRING"
SOUTH WEST COLORADO
W.H. Holmes
S
N

RUINED PUEBLO WITH TOWERS AND CENTRAL HOUSE

"I observed in approaching that a ruined tower stood near the brink of the cliff, at a point where it curves outward toward the river, and, studying it with my glass, detected a number of cave-like openings in the cliff face about half way up. On examination I found that they had been shaped by the hand of man. The arched openings are arched regularly above, and generally quite shallow.

The hard stratum served as a hard floor, and, projecting in many places, made a narrow platform, by which the inhabitants were enabled to pass from one house to another. It is probable that they were walled up in front, with doors and windows, though no fragment of the wall is preserved.

The engraving gives a fair representation of the appearance of these dwellings and their relations to the rooms above. The ruins are three in number, one rectangular and two circular.

The rectangular is placed over the more northern group of cave-dwellings. The small tower is situated on the brink of the cliff also, above the principal groups of cave-houses.

About 150 yards to the south-west are the remains of another structure, built on a larger and grander scale, as the diameter of the outer wall was about 140 feet. That they belong to the community of the Cave-dwellers, and serve as their fortresses, council-chambers and places of worship, would seem to be natural and reasonable inferences. Being on the border of a low mesa country, the strong outside walls were, doubtless, found necessary to prevent incursions from that direction; while the little community, by means of ladders, was free to pass from dwelling to fortress without danger of molestation. (See fig. 7.)

A large group situated on this stream, about 10 miles above its mouth, was subsequently examined. In one place in particular, a picturesque out-standing promontory was full of dwellings, literally honey-combed by the earth-burrowing race; and as one from below views the ragged window-pierced crags, he is unconsciously led to wonder if they are not the ruins of some ancient castle, behind whose mouldering walls are hidden the dead secrets of a long-forgotten people. But a nearer approach quickly dispels such fancies, for the windows prove to be only the doorways to shallow and

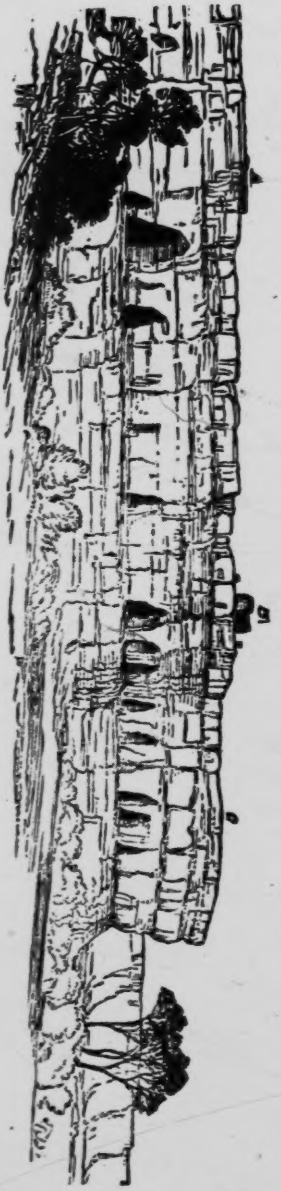
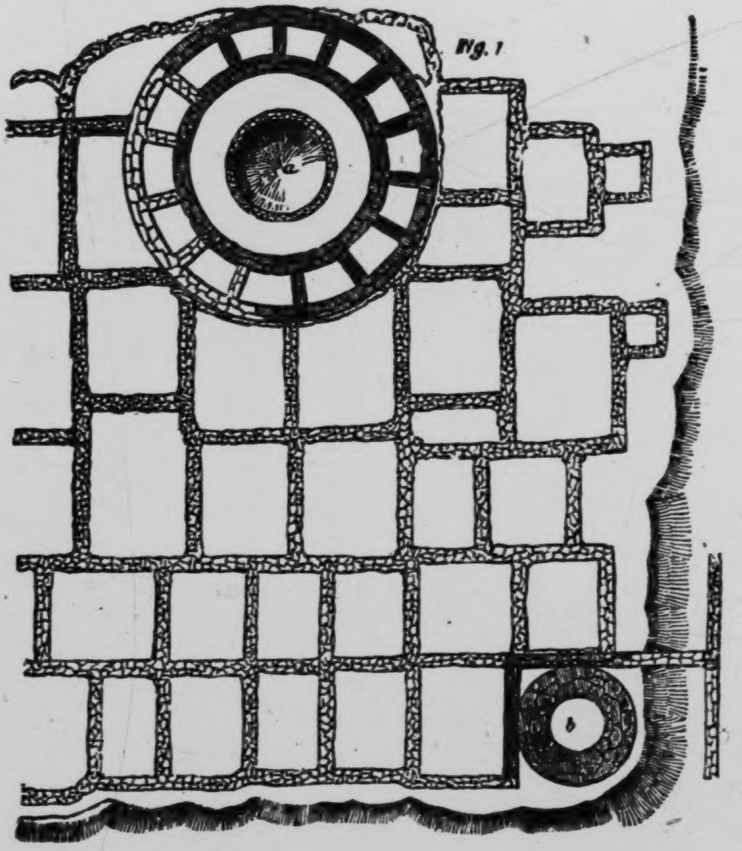


FIG. 7. CAVE HOUSES AND RUINED TOWERS.

irregular apartments, hardly sufficiently commodious for a race of pigmies. Neither the outer openings or the apertures are large enough to allow a person of large stature to pass, and one is led to suspect that these nests were not the dwellings proper of these people, but occasional resorts for women and children, and that the somewhat extensive ruins below were their ordinary dwelling places. On the brink of a promontory above stands the ruins of a tower, still twelve feet high, and similar, in most respects, to those already described. These ruined towers are very numerous."



ANCIENT PUEBLO AND RUINED TOWERS ON THE Mc ELMO

Mr. Holmes also discovered a group of ruins which mark the site of an ancient village, built after the honey-comb pattern, with apartments adjoining, and *estufas*, or circular chambers, in the midst of the apartments. This *estufa* differed from others which are found elsewhere, in that the central chamber was surrounded by a series of chambers built in the form of a circle, thus indicating that the *estufa* in this region was used as a place of permanent abode. This confirms what we have said about the use of the towers which are so numerous in the valley of the San Juan, but are peculiar to the region.* He says:

> A group differing from the preceding, is situated on a low bench within a mile of the main McElmo, and near a dry wash that enters that stream from the south. It seems to have been a compact village or community dwelling, consisting of two circular buildings and a great number of rectangular apartments. The circular structures, or towers, have been built in the usual manner, of roughly-hewn stone, and rank among the very best specimens of this ancient architecture. The great tower is especially noticeable, on account of the occurrence of a third wall, as seen in the drawing and in the plan at *a*. In dimensions it is almost identical with the great tower of the Rio Mancos. The walls are traceable nearly all the way round, and the space between the two outer ones, which is about five feet in width, contains fourteen apartments, or cells. The walls about one of these cells is still standing to the height of twelve feet, but the interior cannot be examined on account of the rubbish, which fills it to the top. No openings are noticeable in the circular walls, but doorways seem to have been made to communicate between the apartments; one is preserved at *d*.
>
> The inner wall has not been as high or strong as the others, and has served simply to enclose the *estufa*. This tower stands back about one hundred feet from the edge of the mesa and near the border of the village. The smaller tower, *b*, stands forward on a point overlooking the shallow gulch, it is fifteen feet in diameter; the walls are three and a half feet thick and five feet high on the outside. Beneath this ruin, in a little side gulch, are the remains of a wall twelve feet high and twenty inches thick. The remainder of the village is in such a state of decay as to be hardly

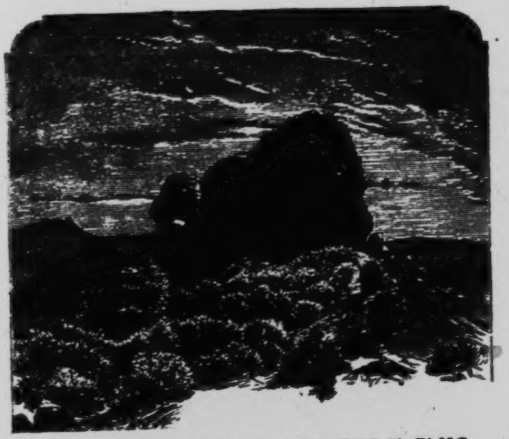


FIG. 8. BATTLE ROCK NEAR THE McELMO

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* Situated on the San Juan River, about 35 miles below the mouth of the La Plata and 10 miles above the Mancos. Here the vertical bluff-face is from 35 to 45 feet in height.

See Hayden's Survey for 1876, p. 398. See Chapter on High Houses.

traceable among the artemisia and rubbish. The apartments number nearly a hundred, and seem, generally, to have been rectangular. They are not, however, of uniform size, and certainly not arranged in regular order. . . . The site of this village can hardly have been chosen on account of its defensive advantages, nor on account of the fertility of the surrounding country. The neighboring plains and mesas are as naked and barren as possible. The nearest water is a mile away, and during the drier part of the season the nearest running water is in the Rio Dolores, nearly fifteen miles away. To suppose an agricultural people existing in such a locality, with the present climate, is manifestly absurd. Yet, every isolated rock and bit of mesa, within a circle of miles, is strewn with remnants of human dwellings.

Another very important group of ruins is located in the depression between the Mesa Verde and the Late Mountains, and near the divide between the McElmo and Lower Mancos drainage. It was christened Aztec Springs. See plate. Mr. Holmes says of it:

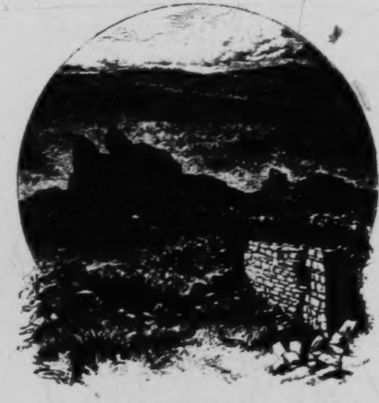

FIG. 9. RUINS ON THE McELMO

The site of the spring I found, but without the least appearance of water. The depression formerly occupied by it is near the centre of a large mass of ruins, similar to the group last described, but having a rectangular, instead of a circular, building, as the chief and central structure. This I have called the *upper house* in the plate, and a large walled enclosure, a little lower on the slope, I have, for the sake of distinction, called the *lower house*. These ruins form the most imposing pile of masonry yet found in Colorado. The whole group covers an area of about 480,000 square feet, and has an average depth of from three to four feet. This would give in the vicinity of 1,500,000 solid feet of stone work. The stone used is chiefly of the fossiliferous limestone that outcrops along the base of the Mesa Verde, a mile or more away, and its transportation to this place has doubtless been a great work for a people so totally without facilities.

The upper house is rectangular, measures 80x100 feet, and is built with the cardinal points to within five degrees. The pile is from 12 to 15 feet in height, and its massiveness suggests an original height at least twice as great. . . . . . Two well-defined circular enclosures, or *estufas*, are situated in the midst of the southern wing of the ruin. The upper one, *a*, is on the opposite side of the spring from the great house, is 60 feet in diameter, and is surrounded by a low stone wall. West of the house is a small open court, which seems to have had a gateway opening out to the west through the surrounding walls. The lower house is 200 feet in length by 180 in width, and its walls vary 15 degrees from the cardinal points. The northern wall, *a*, is double, and contains a row of eight apartments, about seven feet in width by twenty-four in length. The walls of the other sides are low, and seem to have served simply to enclose the great court, near the centre of which is a large walled depression (*estufa B*).[*]

Mr. E. A. Barber has described the ruins at Aztec Springs and as well as the "Black Tower." See fig. 2, Chap. VI, p. 84. He says: "The Black Tower is a short distance below the ruins. A very ancient path, almost obliterated, leads up to the ruin. The situation was an admirable one for over-looking the gulch. Many miles above and below from this point, signals could be telegraphed to distant stations in times of danger, while the miniature castle itself was so sheltered by surrounding trees as to escape the notice of careless observers."

In the vicinity of the ruins just described, and near the Utah border, is a peculiarly interesting cluster of fortifications. A mass of dark-red sandstone, a hundred feet in height, stands in the midst of an open plain, on the top of which the remnants of several walls are still visible.

The most perfectly preserved portion of the group is a rectangular apartment built half-way up on the northern face of the boulder, which has been named Battle Rock because of the legend of a great battle having been fought there. See fig. 9.

In the immediate neighborhood of Battle Rock may be seen a series of diminutive cave dwellers or stone houses. Little hollows, scarcely exceeding six feet in diameter, were walled up at the mouth and occupied as dormitories, or more probably as magazines or caches in which provisions were stored. Scores of these are found through all the adjacent canons, in many instances situated hundreds of feet above the bed of the streams and originally approached by niched steps cut in the perpendicular cliffs, but which have been so worn away by time that they no longer present footholds for the adventurous climber. If we advance in a westerly direction, some fifteen miles to the dry valley of the Hovenweep, *deserted canon*, we discover another large ruined structure built on a mesa which rises to the height of 50 feet in the center of the valley. On this the walls of a fortress or community dwelling are seen, extending to a distance of 275 feet. At some points they still remain standing, 12 feet in height. Many of the corners of the rooms were neatly and accurately curved.

In the plaster, the impressions of finger tips, knuckles and nails are quite distinct and in some instances the delicate lines of the epidermis were distinctly visible.

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[*] Dr. J. S. Newberry visited this region in 1876, and discovered a series of ancient ruins. He says of it: "Like most of the ruined pueblos of New Mexico, it consisted of a series of small rooms clustered together like cells in a beehive. Near the principal edifice are mounds of stone, representing subordinate buildings. Among these are numerous large depressions, marking the place of cisterns, or *estufas*."

Mr. Barber has also spoken of the ruins of Montezuma Canon, which consist of stone walls, of graves, and of long, narrow buildings, all of them situated upon low mesas, giving signs of great antiquity. (See figs. 10 and 11.) The walls are made of long, narrow stones, standing like posts in a fence, the spaces between filled after the usual style of masonry. The graves were arranged in rows and rectangles and occasionally in circles.

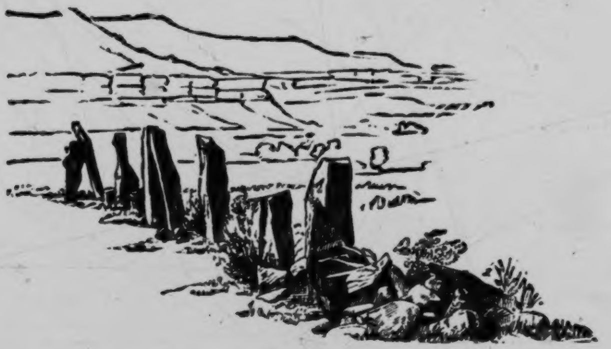

FIG. 10. ANCIENT WALL NEAR MONTEZUMA CANON

We may say of all of these ruins, those on the La Plata, McElmo, and Montezuma Canon, that they exhibit three periods of occupation: the first of which was marked by peacful agricultural settlements; the second by the large community-house which was built in terraces and very compact for the sake of defense; the third by cliff-fortresses and high houses, the invasion of hostile tribes having driven the people farther and farther away from the valleys to the Mesas, free from assault; the second showing a necessity for defense, which was met by building the villages in one compact or great house; the last was fraught with so much danger that the people were obliged to build their houses high up in the cliffs.

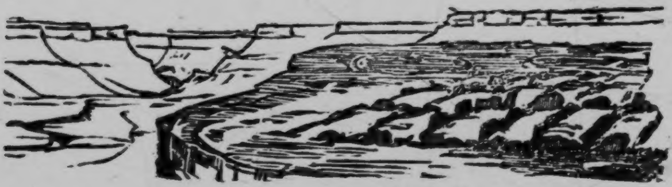

FIG. 11. ANCIENT GRAVES ON THE MONTEZUMA CANON

This brings us to consider the relative age of the pueblos and the cliff-dwellings.

It was formerly the opinion that the Cliff-dwellers were among the most ancient people in America, that their history extended back an indefinite period into the past, and that their departure and final destiny are enveloped in mystery, which it is useless to penetrate. This opinion has been greatly modified by recent exploration, and the evidence now is, that so far from being the earliest people they belong to the last of three periods of occupation, the earliest cf which was marked by "straggling villages" and pueblos, which are now in ruins, the most of them being situated in the valleys near the water courses and irrigating canals, and attended with ancient picture writings or petroglyphs; the second by the pueblos, which are built upon the mesas, the third by the cliff-dwellings. All of these show that the people dwelt here and continued in a peaceful and an agricultural condition for many years, and perhaps centuries, but afterward suffered from the attacks of wild tribes, who invaded their possessions, kept them constantly disturbed, and drove them first to the mesas and afterwards to the cliffs, as the only places where they could be secure. The date of this invasion is unknown, but the general opinion is that it was many years before the first visit of the Spaniards, though many changes took place in the population after that event. Possibly some of the cliff-dwellings have been occupied during the historic period, but if so, it was by the tribes which had long continued to besiege the people in their homes, and in the meantime borrowed many of their arts and perhaps their symbols.

Among these tribes may be mentioned the Utes, the Apaches, and the Navajoes, for the latter people still occupy the region, and occasionally use the ruined pueblos as corals for their sheep and temporary homes for their families.

It is indeed difficult to draw the distinction between the earlier and the later people, for the pueblos and the cliff-dwellings are built in the same general style, and contain similar relics and specimens of art, and are attended with similar pictographs and symbols, yet the conviction grows stronger as we examine these tokens in detail, that the Cliff-dwellers were later than the Pueblos, though the time when they abandoned their homes in the cliffs and surrendered their territory to the wild tribes who now occupy it, is unknown.

It is interesting to go over the region and study the structures, and especially the pictographs, and read in them the early history of the people and mark the changes that came upon them.

We may say here, that the pictographs are the most interesting tokens. These have been noticed by all the explorers who have visited the cliff dwellings, beginning with Lieuts. Simpson and Ives, who described those which are near the pueblos of the Zunis and including Messrs. Holmes and Jackson, who described those found near the cliff-dwellings of the San Juan, and those who have lately studied the pictographs in the shelter caves, all of whom hold that the cliff-dwellers had a way of recording events which was understood by them, but to us is obscure.

Some of these pictographs have modern figures mingled with the ancient, viz., men with guns, and horses with saddles upon them; evidently placed there by Indians after the advent of the white man. The majority of them, however, have figures and symbols, which belonged to pre-historic times, as a strong resemblance can be traced between them and others which may be found upon the rocks near the ruins on the Gila river, and the ancient pueblos on the Zuni and elsewhere. Among these pictographs are some which are very ancient. To illustrate, one described by W. H. Holmes represents a long line of animals, some of which were domestic dogs, llamas and turkeys, the line forming a procession, as if in the act of migrating, though possibly they may be driven by men into the corals. In this pictograph is a figure resembling a reindeer and a sledge, conveying the idea that the person who made it was familiar with scenes common among the Esquimaux. Similar pictographs, representing llamas, are described by Dr. Washington Matthews[1] as found upon rocks in the Puerco valley.

These pictographs represent hunters or herdsmen in the act of casting lassos [See plate, Fig. 19], also holding in their hand a peculiar four-branched instrument. One rock inscription shows a number of these animals with a hunter, who bears a bow in one hand and a line in the other. Another represents a company of dancers, as in front of the hunter. Still another depicts a bola thrower in connection with a flock of turkeys. Knotted cords have been found in sacrificial caves which resemble quippus or the knotted cords of the Peruvians.

There were also unearthed terra cotta images of llamas in the ruins of some of the ultra mural houses near Los Muertos, on the Rio Gila.

The pictographs in the shelter caves and near the cliff-dwellings depict certain wild animals, such as Rocky Mountain goats, elks, wild turkeys, snakes, centipedes, but none of them represent the llama or the bola throwers. These convey the impression that a great length of time had passed between the first settlement of this region, and the time when the people were driven to the cliffs for safety.

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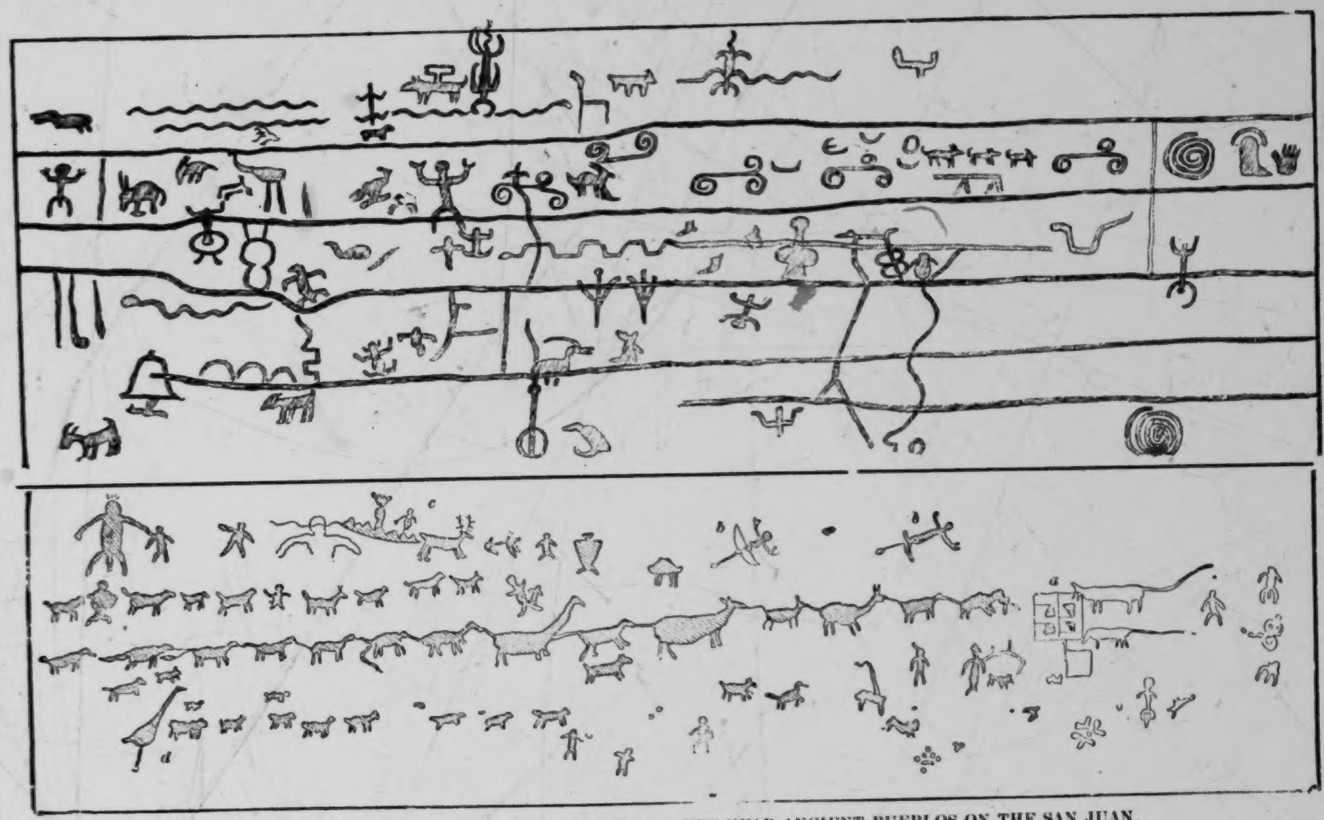
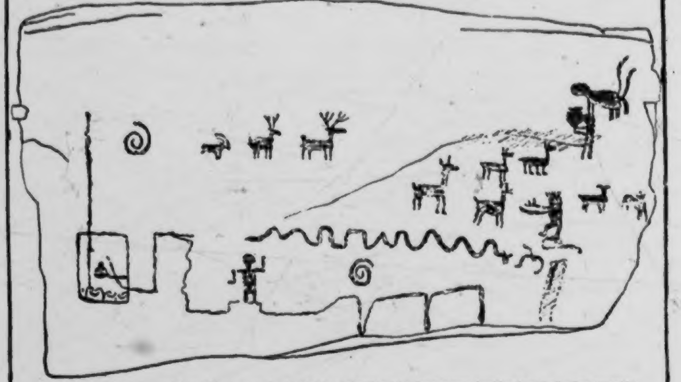
(1) Dr. Matthews says an intimate relationship exists between the builders of the ancient Salado temples and the ancient pueblos of Arizona and New Mexico, a relationship also less intimate between them and the ancient house building tribes of Old Mexico. There are facts which point to a close connection between this people and the ancient Peruvians. It has been surmised that such animals continued to be domesticated by the sedentary Indians down to historic days, but Mr. Bandelier says, if there has ever been a llama Guanaco or Vicuna known to the southwestern Indians it became extinct long previous to the sixteenth century."



PICTOGRAPHS IN SHELTER CAVES AND ON THE ROCKS NEAR ANCIENT PUEBLOS ON THE SAN JUAN.



Rock Inscription, representing, it is supposed, vicuña-like animals and bola-thrower, besides deer and other animals.

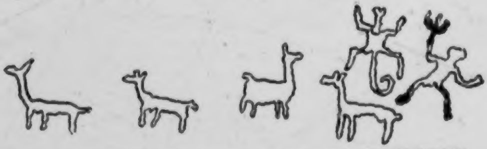


FIG. 17.—Rock inscription thought to represent vicuña-like animals and man throwing bolas

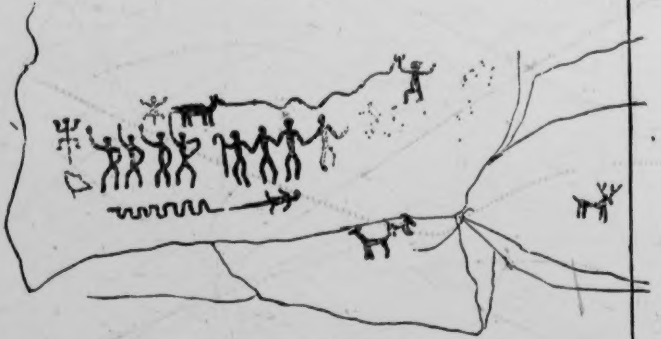


FIG. 19.—Rock inscription of supposed bola-thrower, dancing men, and other objects.

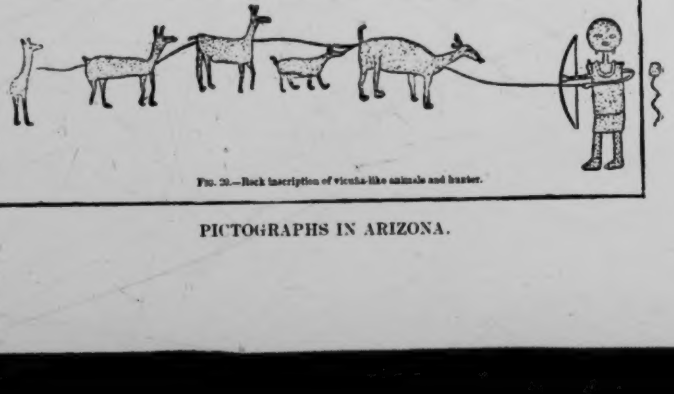


FIG. 20.—Rock inscription of vicuña-like animals and hunter.

PICTOGRAPHS IN ARIZONA.

It is a singular fact that no image or pictograph of the buffalo has been found in the pueblo territory, though that animal was very common in the Mississippi Valley.

Still, the procession of animals, guarded by dogs and men, would indicate that the custom of driving animals into corals or through game drives, was as common among hunters here as farther east, where buffalos and larger animals were hunted.

The pictographs near the ancient pueblos show that they were occupied by people sedentary in their habits, who had domestic animals, and used their wool as well as cotton for their fabrics, and depended upon agriculture and irrigation for subsistence; but the pictographs of the Cliff-dwellers, on the other hand, would indicate that their life had become wild, and that they had resorted to hunting as the means of subsistence, the contrast between the earlier and later periods being brought out by all these circumstances.

Here, then, we have the same problems brought up by the pictographs, which we have found so formidable among the Mound-builders, for the appearance of extinct animals, such as the llamas and the elephants, suggest great antiquity and a diversity of origin to the people, as the llamas are animals that belong to the Southern continent, and not to the Northern.

Another proof of the great difference in time, between the first erection of the pueblos and the resort to the cliff-dwellings, is presented by the condition of the structures themselves.

We have shown that the pueblos in the valley of the San Juan were nearly all in a state of ruin. The cliff-dwellings on the other hand are generally well preserved. This has been explained by the fact that buildings in the "open" will go to ruin much faster than those sheltered by the "rocks," but this will not account for the great difference between them.

The cliff-dwellings are built on the same general plan as the pueblos. They have courts and streets, store houses and store rooms, estufas, terraced houses, balconies, look-outs and towers exactly as the pueblos have, and are generally near the streams and springs of water, but the walls are for the most part in perfect condition, and the relics and remains are well preserved. Their walls all stand, the floors and roofs remain, the windows and doors retain their original shape. The towers are as symmetrical and complete as when first built, and the estufas, though their walls are thrown down, often retain ornaments and shapes which they had when they were occupied. The impression formed by most of the visitors to the cliff-dwellings is that they were comparatively modern, for some of them look as if they had been just left, and one is led to expect that some lingering survivor of the denizens of the cliffs will arise to confront him and arrest his steps. The explorer among the ruins of the pueblos on the other hand is always impressed with the sense of their great age, and he begins to speculate as to how many centuries have passed since they stood in their stately magnificence, as ornaments in the landscape, and were filled with a teeming multitude of agriculturists, who drew the water for irrigating the soil from streams near by. It is the testimony of most explorers that the pueblos of the ancient or early period, were superior to those erected in later times in their general style and finish, number and conveniences of their apartments, and in their surroundings, indicated that the people who occupied them were then in a higher state of advancement than their successors, either in this region or in any of the pueblo territory.

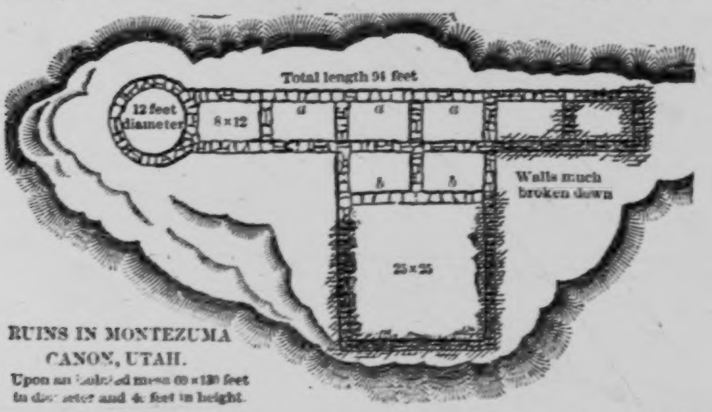
Still, after examining the ornaments, relics and pictographs one is convinced that the people who beat a retreat to the cliffs were the same as those who built the pueblos, for they show the same taste and skill, the same stage of advancement and the same religious sentiment, and the same desire to perpetuate the records by signs and symbols. The only difference is that the cliff-dwellings were erected by a people who had been driven from their permanent and peaceable homes, and compelled to build their houses in the deep recesses of the rocks, and make their villages, fortresses, the chief protection consisting in the fact that they were inaccessible. This would show that the pueblos, which we have seen, were so numerous in the valley of the San Juan and its tributaries, some of them situated on the mesas and others in the valleys, were the more ancient. Those of the Tusayans and Zuni were the more modern, but the cliff-dwellings were built at an intermediate date.

The conclusion we reach, after comparing the several classes of ruins, is that the agricultural settlements which formerly filled the valleys, and which teemed with a peaceable and prosperous people, had been broken up by invading savages, but the people fled to the cliffs, and built their towns in these rocky fastnesses, where they followed a precarious livelihood, as their homes were always subject to alarms.

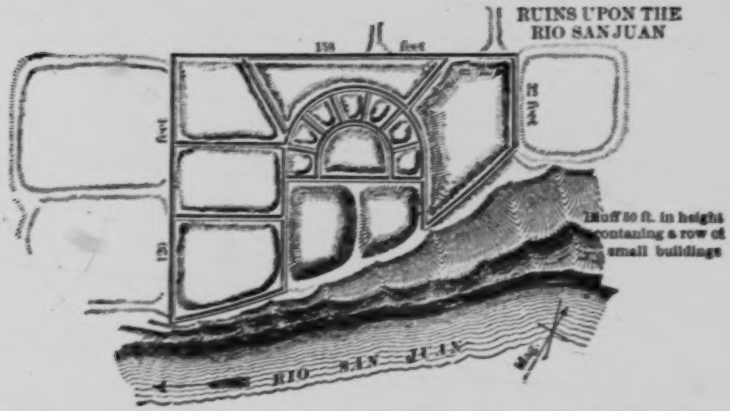
Many specimens of pueblos of the earlier period have been found on the San Juan. We add a few cuts, which perhaps represent the structures of the same period, as they are small pueblos built upon the mesas, descriptions of which have been given by W. H. Holmes. One of these was in the Montezuma Canon. The ruin occupies one of the small, isolated mesas, and was composed of a wall made up of long blocks, which were placed upright, similar to those already described, but the spaces between the uprights were filled with smaller rocks. The second ruin was upon the Rio San Juan. "It was a small pueblo situated upon a bench about fifty feet above the river. In the center of the building was a court seventy five feet wide, averaging forty feet in depth. Back of the court was a series of seven apartments, arranged in a semicircle, and outside of these other larger rooms.

Extreme massiveness is indicated throughout the whole structure. It was also of great age."

In contrast with these is the two-story cliff house, which has been described as situated on Butlers Wash. It shows the change from the communistic house back to the "straggling village," as the houses were all separate, though the same elements of the village were retained. This house was furnished with a balcony and modern looking doors. Its roof was supported by timbers which stretched from the outer wall to the rocks in the rear. There are many such houses in this region. They indicate that the clan life had already been broken up.


Total length 94 feet
12 feet diameter
8×12
a
a
a
b
b
Walls much broken down
25×25

RUINS IN MONTEZUMA CANON, UTAH.
Upon an isolated mesa 60×130 feet in diameter and 40 feet in height.


130 feet
feet
feet
121
Bluff 50 ft. in height containing a row of small buildings
RIO SAN JUAN

RUINS UPON THE RIO SAN JUAN

It is probable that at one time a dense population occupied the valleys of all the larger streams, such as the San Juan, including its branches, the Animas, La Plata, Chaco, the McElmo and

Hovenweep, and the Rio Grande and its branches, the Gila and its branches, including the Verde, the Salt River, Colorado River, including the Little Colorado and the Chiquito, for there are ruined pueblos scattered over this region, some of them "Great House Pueblos," others "Boulder Sites," and still others "Castles" (casas), "Cavate Houses" and "Cliff Towns."

The most interesting pueblo of the ancient or early period is the one situated on the Animas River, near the little village of Aztec, New Mexico. This was visited by Lieut. Rogers Birnie in 1875, by Mr. L. H. Morgan in 1877, Mr. L. W. Gunckel in 1892, and descriptions given by each.[1] The following is Mr. Morgan's description:

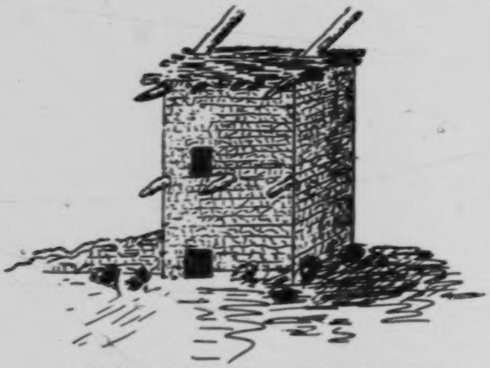


Fig. 12. TWO-STORY CLIFF HOUSE.

> This pueblo is one of four situated within the extent of one mile, though there are four or five smaller, inferior ruins within the same area. It was five or perhaps six stories high [See Fig. 13] and consisted of a main building 368 feet long, two wings 270 feet long, with a fourth structure made with two walls, which crossed from the end of one wing to the end of the other, and enclosed an open court in which was a large estufa. It was built in a terraced form and had its rooms arranged after the "honeycomb" pattern, but differed from others in that the partition walls stand out three or four feet like buttresses, and show that the masonry was articulated, and that the partition walls were continuous from front to rear, and the walls of the several stories rested upon each other. Every room in the main building was faced with stone, on the four sides, and had an adobe floor and wooden ceiling. Each room had two doorways and four openings about twelve inches square, two on each side of the doorway near the ceiling. The openings were for light and ventilation. The neatness and the general correctness of the masonry is best seen in the doorways, some of which measure three feet, four inches, by two feet, seven inches. The rooms in all cases ran across the building, from the external court to the exterior wall, and were connected with those below by means of trap-

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(1) For Lieut. Birnie's description see Wheeler's Survey of 1875, page 178; Morgan's Houses and House Life, p. 173, Fig. 40; Illustrated American, May 28, 1892, article In Search of a Lost Race, p. 88.

doors and ladders, with those in front and back and at the side by doorways, after the pattern in the present occupied pueblo of Taos.

The families lived in the second and upper stories, and used the rooms below for storage and for granaries. Each family had two or four or six rooms, and those who held the upper rooms held those below. The number of apartments would make an aggregate of four hundred rooms. The house was a fortress, and also a joint tenement house of the Aboriginal American model, and indicated an ancient communism in living, practiced by large households (or clans) formed on the principle of kin. It presented a great resemblance, in its general plan and the arrangement of the rooms and courts, and especially in the style of building the walls, with alternate courses of thin stone, to the ruined pueblos on Rio Chaco, about sixty miles distant, described by Gen. J. H. Simpson.

Near this pueblo is another, built in two sections, with a space about fifteen feet wide between them, though they were probably connected in the upper stories and inhabited as one structure, the openings between them forming a passage way resembling that still existing at Walpi and other Tusayan villages.

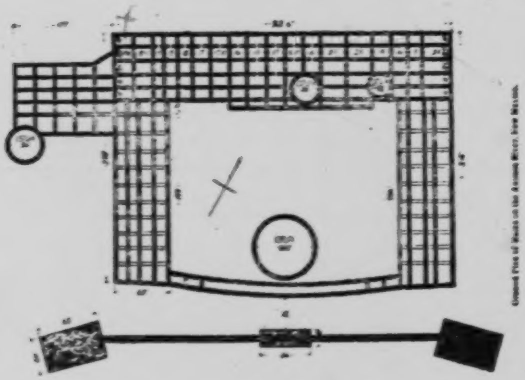

Fig. 13. PUEBLO ON THE ANIMAS.

The largest of these buildings seemed to have an open court in the center in the form of a parallelogram. The most remarkable feature was the following: "Midway between this pueblo and the larger one just described, is a circular ruin 330 feet in circuit, which seems to have consisted or two concentric rows of apartments, around an enclosed estufa, built of cobble stone and adobe mortar, which was probably used as a council house or assembly place for the entire Phratry."

"From the number and size of the houses there was probably a population of at least 5,000 persons at this settlement, who lived by horticulture. The supply of water for irrigation[1] at the pueblo was abundant, as the valley of the Animas River is here broad and beautiful and about three miles wide, the river passing through the center of the valley. The cliff on each side of the plain is bold and mountainous, rising from 1,500 to 2,000 feet high.

These pueblos, newly constructed and in their best condition must have presented a commanding appearance. From the material used in their construction, from their palatial size and unique design, and from the cultivated gardens with which they were undoubtedly surrounded, they were calculated to impress the beholder very favorably with the degree of culture to which the people had attained."

This description by L. H. Morgan is worthy of attention from the fact that he recognized the buildings as the abode of a phratry[2] and suggests that here was a large agricultural settlement.

It would seem from all the accounts that have been written that there was here a group of pueblos which resembled those on the Chaco river to the south, all of which are now in ruins and evidently very ancient.

It is not known whether there was any confederacy,[3] but it seems probable that the clans or tribes who dwelt in the pueblos of the San Juan valley were allied, and the wonder is that they could have been driven off by the wild tribes. This was owing to the fact that each Pueblo was independent or under the direction of a chief, but there was no organization which extended to the other Pueblos, or brought them under one head. This seems to have been the case even with the Iroquois or six tribes until the time that Hiawatha organized them into a confederacy.

It would seem that the Pueblos were long beset by the wild tribes, for their style of erecting buildings in terraces surrounding a court, with a wall in front of the court, was well adapted for protection against a lurking foe. There were also provisions made for defense against a sudden attack, as there were lookouts and towers on every high point, and some of the pueblos them-

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(1) That there were irrigating canals, which could escape observation, is evident from a discovery which was made in 1896 by Capt. D. D. Gaillard, U. S. A. It appears that a dam, five and one-half miles in length, in Grant County, New Mexico, composed of sedimentary material, but having the appearance of great age, was found. The materials of the dam, the direction of its axis, the regularity of its slopes, the uniformity in elevation of its crest, the fact that it joins high ground at both ends, and its location, would indicate that this remarkable earth work was of artificial construction; but so gigantic is the work that it was taken for a natural ridge.

(2) According to Mr. L. H. Morgan, a phratry was a brotherhood composed of related clans, and was caused by a separation of a tribe into two divisions for social and religious purposes, but implies nothing concerning the existence of confederacy. The phratry was without governmental functions, for these belong the tribe, but it had much to do with social affairs.

(3) Where several pueblos were situated near each other on the same stream, the people were of common descent, but they were not necessarily under a tribal or a confederate government. The tribes held religious festivals at particular seasons of the year, which were observed with forms of worship, dances and games. The medicine lodge, with the wild tribes, was the center of these observances; but among the Pueblos it was the kiva. Military operations were usually left to the action of the voluntary principle.

selves were situated on the mesas, where they could command extensive views of the valleys.

"There were many signs of a prehistoric race which once lived and prospered in this region. On almost every prominent point are mounds of debris and rudely squared stones, which mark the houses of the people, all in a state of a far advanced ruin, with but few walls remaining intact, projecting above the mounds. The valley, if properly irrigated, is excellent land for farming and orchards, though there are, at present, few signs of irrigating canals.

The forests are few and found only at great altitudes, but in the ledges and cliffs, which line and enclose the water courses, there were, everywhere, loose stone, lying in blocks, ready for the builders' hand It was probably here that the early inhabitants learned to build their dwellings of stone and that the communal houses or pueblos of stone first reached their pretentious dimensions. Among the most interesting of the relics which were left by the prehistoric people were the delicately formed arrow-points made from obsidian, jasper, moss-agate and flint of many and variegated tints and colors. Several pottery bowls, with red decorations, containing flint knives; one cup shaped bowl with a long handle, and one or two mugs with a bent handle; vases with handles on either side, bottles, jars and mortars were found, all of which showed that the domestic pottery was generally decorated There are many other pueblos in this vicinity which illustrate the contrast between ancient and modern structures. One of these has been described by Mr. Gunckel. It is situated upon the La Plata, about three fourths of a mile south of the Colorado State line, near the Reservation of the Utes. He says:

> "It forms one of the most prominent and imposing points, from which the view up and down the river is magnificent. From any point in the ruins one can see fifty miles or more through the fertile valley, which extends along the La Plata, bounded on each side by mesas. The altitude of the ruins is 6,100 feet above the sea level, and 125 feet above the La Plata.
>
> It speaks well for the ancient builders of this communistic town that they chose such a favorable site for their abode, as it is near good water, high above the surrounding mesas, where the scenery was magnificent and here an enemy could be repulsed by a mere handful of men."
>
> With all this they took the precaution to build a circular "watch tower," 100 feet above and 300 feet westward of the town, on a high sandstone promontory, thus doubly insuring the safety. From this tower one could see the approach of an enemy for miles away. The ruins contain about 100 rooms, and were originally about three stories in height, but the rooms were filled with accumulated dirt and stones. One peculiarity of the ruin was a double row of walls two feet apart, running parallel to each other, and evidently formed a passage way, or covered way, from one part to the other.
>
> One room on the west side seemed to have been used as a kiln for the baking of pottery. Near this was an estufa, measuring thirty-six feet across and of considerable depth. Several smaller estufas are situated on the north side of the ruin."
>
> At one place about fifty feet from the ruins we were surprised to note

a square, chimney-like hole, carefully walled upon all sides. It measured fourteen inches across and went down fully eight feet. It was neatly faced with hard stone and had a stone floor. At a depth of six feet it turned and formed a horizontal passageway.

This air-passage is worthy of notice because of its resemblance to those found among the cliff-dwellings. It shows that the same style of constructing their estufas prevailed among the two classes of people. The pueblo near which it was found was in about the same state of ruin as those on the Chaco and the Animas Rivers, and resembled those in many points. The estufa, however, was exactly like those found among the cliff-dwellings farther west, and shows that the people fled there after a prolonged attack from the wild tribes.

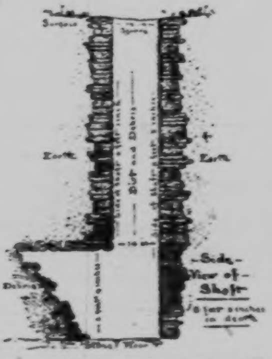

Fig. 14. AIR PASSAGE FOR ESTUFA.

This leads us to a study of the estufas, especially those which are formed among the ancient pueblos and the cliff dwellings.

It is in the estufa that we find the key to the history of the pueblos and a proof of the connection between the ancient and modern structures.

It appears that the kiva or estufa was originally a circular chamber, patterned after the circular huts, but it changed its form during the time that the cliff-dwellings were erected, and it finally assumed the rectangular shape.

The round shape of the estufa is most easily explained on the hypothesis that it is a reminiscence of the Cliff-dwellers' nomadic period. The construction of a cylindrical chamber within a block of rectangular rooms involves no small amount of labor. We know how obstinately primitive natives cling to everything connected with their religious ideas. What is more natural than the retention for the room where the religious ceremonies were perfomed, of the round shape characteristic of the nomadic hut? This assumption is further corroborated by the situation of the hearth and the construction of the roof of the estufa.

Mr. Mindeliff says: "The circular kiva is a survival of an ancient type—a survival supported by all the power of religious feeling and the conservatism in religious matters

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A feature which seems to have also been found at the large pueblo on the Animas River.

characteristic of savage and barbarous life; and while most of the modern pueblos have at the present time rectangular kivas, such, for example, as those at Tusayan, at Zuni, and at Acoma, there is no doubt that the circular form is the more primitive and was formerly used by some tribes which now have only the rectangular form, due to expediency and the breaking down of old traditions, was a very gradual process and proceeded at a different rate in different parts of the country. At the time of the Spanish conquest the prevailing form in the old province of Cibola was rectangular, although the circular kiva was not entirely absent; while, on the other hand, in the cliff ruins of Canyon de Chelly, whose date is partly subsequent to the sixteenth century, the circular kiva is the prevailing if not the exclusive form."

It will be noticed that the estufas which were connected with the ancient and ruined pueblos, both at San Juan and the Chaco, were all of them circular and generally placed inside of the area and in front of the terraces. They were probably used for ceremonial rites as well as for "council houses."

The estufas of the Cliff-dwellers were placed in front of the line of the houses and were generally entered from the top. Some of them were built in with the walls of the houses, the outside formed a rectangle which corresponded with the square rooms, but the inside was in the form of the circle; the walls being divided into six spaces with ledges, resembling broad window sills, alternating with abutments. The opening to the air-chamber was near the floor; the fire-place in the center, but was partitioned off from the air-chamber by a low fragmentary wall. This typical form of the estufas shows that the religious sentiment prevailed in its erection, and that it was a sacred chamber in which the four divisions of the sky and the zenith and nadir were symbolized.

Among the modern pueblos the estufa was a rectangular room with a division in the floor; the sipapuh, or place of emergence, being in the lower floor. The upper floor was the place of assembly, on this the ladder rested which led up to the opening in the roof, fire-place being generally between the foot of the ladder and the sipapuh. In these kivas, the roof was also divided into stories, the upper part being arranged so as to lead to the open air, the whole structure embodying in itself the myth concerning the origin of the people and the four caves through which they passed before they reached the surface of the earth. [See Plate.]

Thus we have three different forms of the estufa, each one representing a different stage of development, but all showing the same orgin and use, and embodying the same, or similar, myths and religious symbols, viz: The myth of creation and the symbol of the sky and the universe.

As evidence of the development of the estufas from earlier forms, Mr. Cushing refers to certain painted marks on the walls of the cliff-kivas, which he thinks represent the posts which were planted at four equidistant points, and supported the large huts, or round houses, which constituted the abodes of the people, and correspond almost strictly to the poles of the primitive "medicine tent" or the "medicine earth lodge." In the modern square kiva of Zuni, there are still placed parallel marks, from the tops of the walls to the floors, every fourth year, which are called by the Zunis the "holders-up" of the doorways and roofs.

> It is not improbable that the first suggestion of enclosing the round kiva in a square-walled structure, and of covering the latter with a flat roof, arose, quite naturally, before the Cliff-dwellers descended into the plains.
>
> In the larger and longest occupied cliff-towns, the straight-walled houses grew outward, wholly around the kivas. The round kiva was not only sursounded by a square enclosure by the walls of the nearest houses, but it became necessary to cover it with a flat roof, in order to render continuous the house terrace in which it was constructed. An evidence that this was virtually the history, is found in the fact that to this day all the ceremonials performed in the great square kivas would be more appropriate in round structures, for the ceremonials are performed in circles, and the singers for dances and sacred dramas are arranged in circles.[1]
>
> A still further evidence is found in the six niches and six pillars so characteristic of the cliff-dwellings, for in this was typified the arrangement of the world into six great spaces, corresponding to the "four quarters" and the "zenith and the nadir." The grouping of the towns of the Zunis, or of the wards in the towns, and of the totems in the wards, followed the same mythical division of the world, the ceremonial life of the people and the governmental arrangement having been completely systematized.
>
> Believing, as the Zunis do, in the arrangement of the universe and in the distribution of the elements according to the same "world quarters," it was but natural that they should have societies or secret orders who should dramatize their mythology and devices for symbolizing the arrangement of the sky and the earth, and the central space or fire in their kivas, as well as in their larger compact pueblos.

Mr. Nordenskjold has referred to this point in describing the kivas or estufas of the Cliff-dwellers.

"Of equal significance with this persistency of survival in the kiva, of the earliest cave-dwelling hut rooms, through successively higher stages in the development of cliff architecture, is the trace of its growth ever outward; for in nearly or quite all of the larger cliff ruins, the kivas occur along the fronts of the houses that are farthest out toward the mouths of the cavern, but some are found quite far back in the midst of the houses; in every instance of this kind the kivas farthest back, within the cell cluster proper, not only the oldest, but

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(1) See Zuni Creation Myths. Thirteenth Annual Report of Bureau of Ethnology page 364.

in other ways, plainly mark the line of original boundary or frontage of the entire village. In some of the largest of these ruins the frontage line has been extended, the houses have grown outward and around and past the kivas, and then, to accommodate increased assemblies, successively built in front of them, not once or twice, but in some cases as many as five times."

The traditions connected with the estufas are worthy of notice. Mr. Bandelier says of these:

> Allusions occur in some of the traditions, suggesting that in earlier times one class of kiva was devoted wholly to the purposes of a ceremonial chamber, and was constantly occupied by a priest. An altar and fetiches were permanently maintained and appropriate groups of these fetiches were displayed from month to month, as the different priests of the sacred feasts succeeded each other, each new moon bringing its prescribed feast.
>
> Many of the kivas were built by religious societies, which still hold their stated observances in them, and in Oraibi several still bear the names of the societies using them. A society always celebrates in a particular kiva, but none of these kivas are now preserved exclusively for religious purposes; they are all places of social resort for the men, especially during the winter, when they occupy themselves with the arts common among them. The same kiva thus serves as a temple during a sacred feast, at other times as a council house for the discussion of public affairs. It is also used as a workshop by the industrious and as a lounging place by the idle.
>
> There are still traces of two classes of kiva, marked by the distinction that only certain ones contain the sipapuh, and in these the more important ceremonies are held. It is said that no sipapuh has been made recently. The prescribed operation is performed by the chief and the assistant priests or fetich keepers of the society owning the kiva. Some say the mystic lore pertaining to its preparation is lost and none can now be made. It is also said that a stone sipapuh was formerly used instead of the cottonwood plank now commonly seen. The use of stone for this purpose, however, is nearly obsolete, though the second kiva of Shupaulovi contains an example of this ancient form. In some of the newest kivas of Mashongnavi the plank of the sipapuh is pierced with a square hole, which is cut with a shoulder, the shoulder supporting the plug with which the orifice is closed. This is a decided innovation on the traditional form, as the orifice from which the people emerged, which is symbolized in the sipapuh, in described as being of circular form in all the versions of the Tusayan genesis myth. The presence of the sipapuh possibly at one time distinguished such kivas as were considered strictly consecrated to religious observances from those that were of more general use.

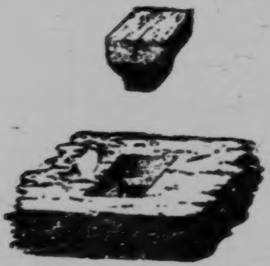
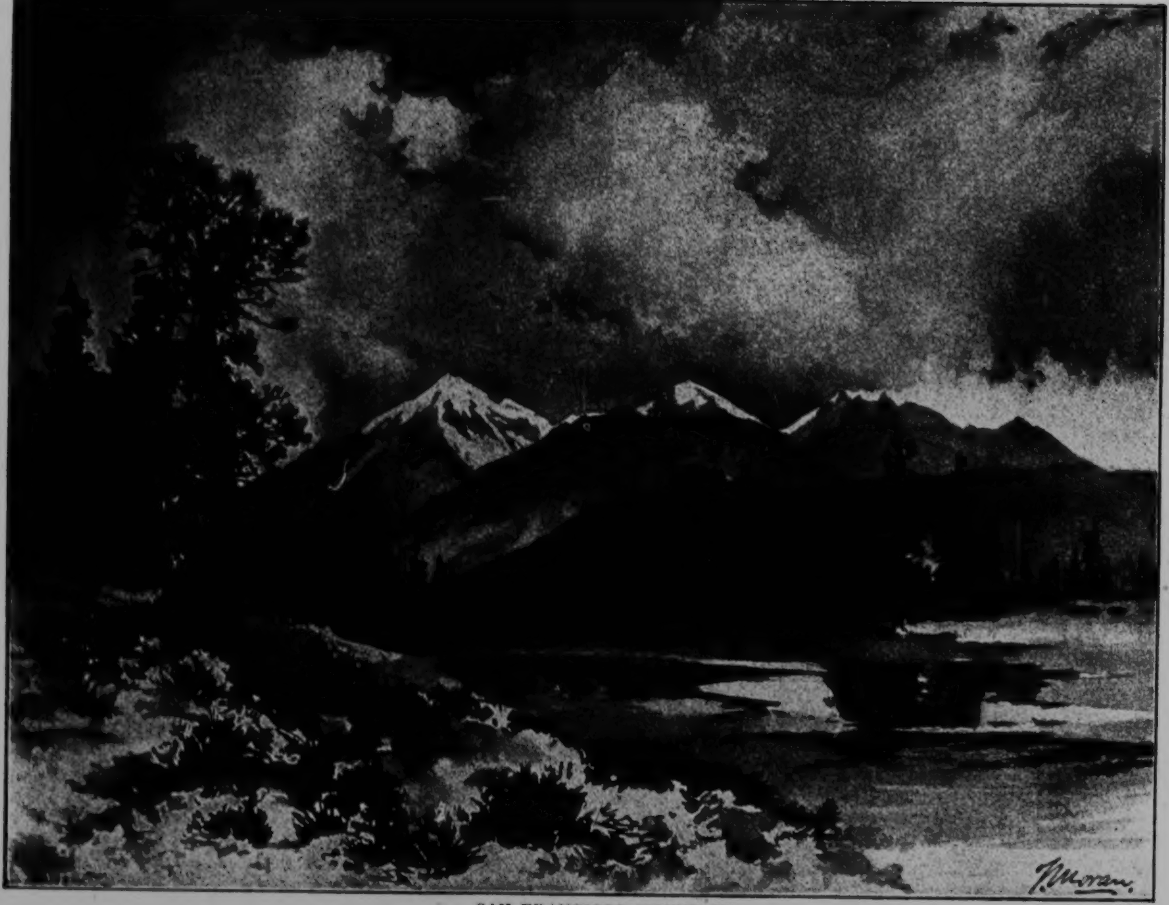


Fig. 15. SIPAPUH AND PLUG.

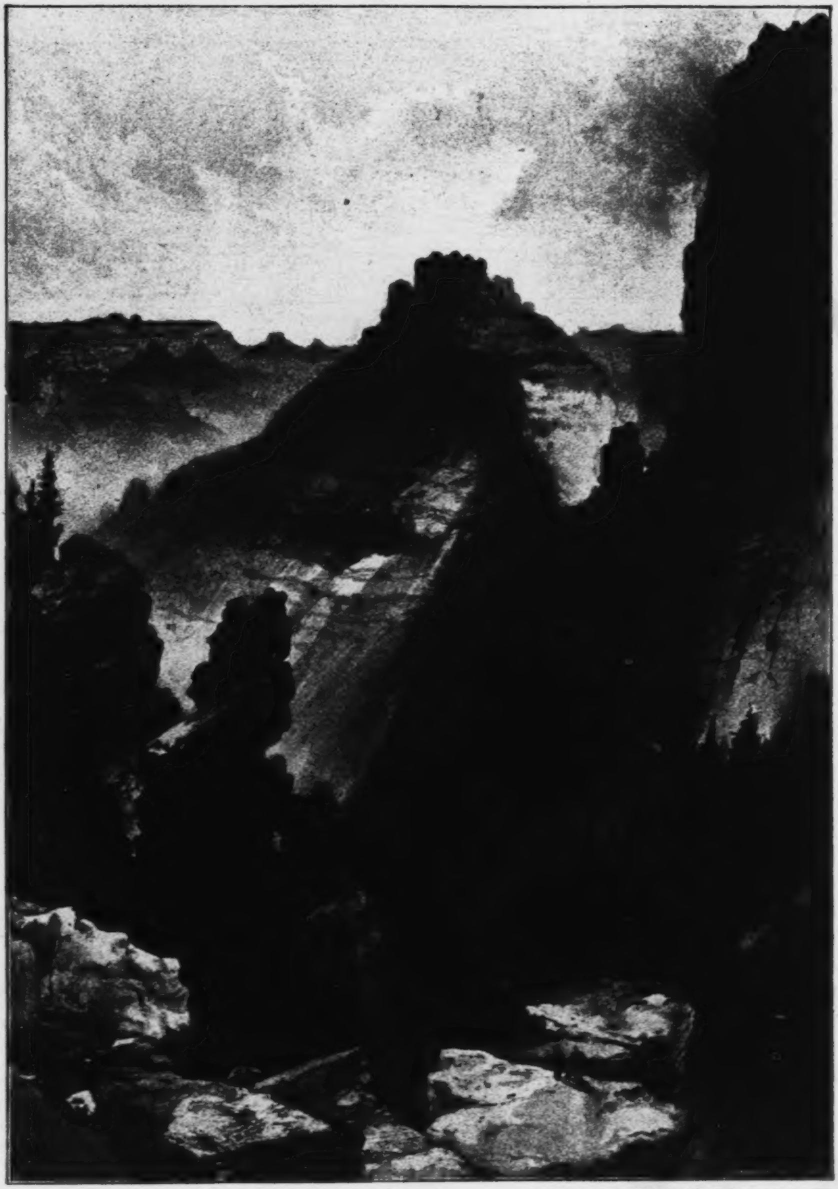
> The designation of the curious orifice of the sipapuh as "the place from which the people emerged," in connection with the peculiar arrangement of the kiva interior, with its change of floor level, suggested to the author that these features might be regarded as typifying the four worlds of the genesis myth that has exercised such an influence on Tusayan customs; but no clear data on this subject were obtained by the writer, nor has Mr. Stephen, who is especially well equipped for such investigations, discovered that a definite conception exists concerning the significance of the structural plan of this kiva. Still, from many suggestive allusions made by the various kiva chiefs and others, he also has been led to infer that it typifies the four "houses," or stages, described in their creative myths. The sipapuh, with its cavity beneath the floor, is certainly regarded as indicating the place of beginning, the lowest house under the earth, the abode of Myuingwa, the Creator; the main or lower floor, represents the second stage; and the elevated section of the floor is made to denote the third stage, where animals were created. Mr. Stephen observed, at the New Year festivals, that animal fetiches were set in groups upon this platform. It is also to be noted that the ladder leading to the surface is invariably made of pine, and always rests upon the platform, never upon the lower floor; and in their traditional genesis it is stated that the people climbed up from the third house (stage) by a ladder of pine, and through such an opening as the kiva hatchway; only most of the stories indicate that the opening was round. The outer air is the fourth world, or that now occupied.

Our conclusion is, then, that the history of the mysterious people who occupied the different parts of the pueblo territory is recorded in the very structures which they built but left behind them, and as evidence may refer to the fact that the pueblos of the Zunis and Tusayans were constructed by immigrants from different directions, the diverse character of the buildings showing that here are gathered the survivors from all the districts—the Cave-dwellers, Cliff-dwellers, Pueblos, and all the transitional types, showing even their migration routes, and giving hints as to their former location and their diverse origin. As Mr. Cushing has said:

> There is to be found, throughout the Zuni country, ruins of the actual transitional type of the pueblo, formed by two ancestral branches of the Zunis—the round town, with its cliff-like outer wall merging into 'the square, and the terraced town, with its broken and angular or straight outer walls; towns from the round forms into the square. This was brought about by a two-fold cause. When the Cliff-dwellers became the inhabitants of the plains, not only their towns, but their kivas, were enlarged, and it became difficult to roof them over with cross-laid logs; hence, in many cases the kiva was enclosed in a square wall, in order that the rafters parallel to one another might be thrown across the top, thus making a flat roof similar to the terraced roof of the ordinary house structure.
>
> There is evidence, also, of another kind, to show that this coming together was the chief cause of the changes referred to. The western branch of the Zuni ancestry, who were the people of the "Midmost," according to the myths, were, from the beginning, dwellers in square structures, and their village clusters, or pueblos, were built precisely on the plan of single house structures. When several of their dwelling places happened to be built together, they were combined, so the pueblos were simple extensions, mostly recti-linear, of these simple houses.
>
> If the intruded branch of the Zuni ancestry were, as has been assumed, of extreme southwestern origin, we should expect to find structural modifications of the Cliff-dweller and the round town architecture. These ancient people, of the Colorado region, had attained to a high state of culture, in Southern Arizona and Northern Mexico; and at the time of their migration, built houses of a different type from those among the cliffs of the North.



SAN FRANCISCO MOUNTAIN.



'Courtesy of Santa Fe Railroad.

SCENE IN THE GRAND CANYON.

# CHAPTER XI.

## CLIFF FORTRESSES.

In continuing the description of the cliff-dwellings, and especially of those which are situated at great heights and provided with so many means of defense, it is very natural that we should give to them the name of "Cliff Fortresses."

We use the term not so much to designate a separate class of structures, or to prove that there was any resemblance between them and modern fortresses, as to show the precautions which the Cliff-dwellers took to protect themselves from their enemies. The name is appropriate when applied to those ruins which were situated on the San Juan, and which have been described by the various explorers of that region, and have been called the "Cliff Palace," the "Long House," "Loop-Hole Fort," "Balcony House," "Sandal Cliff-House," all of which were really fortified villages.*

It is also appropriate when applied to the villages which were situated on the summits of the high Mesas in the neighborhood of the Rio Grande, and which were occupied by various tribes when the Spaniards first visited that valley. It is especially appropriate when used in connection with the ruins which have been discovered on the Rio de Chelley and the Rio Verde, Walnut Canyon and the regions north of the San Francisco mountain.

It may be well, for the sake of convenience, to confine the name to those structures which are found on the mesas and in the sides of the cliffs, but have not been occupied since history began, the inhabitants of which are totally unknown. We call them fortresses because some of them were placed above pueblos which were situated in the valleys, and were evidently places of retreat for the Pueblo tribes which made their permanent homes in the valleys, and because they seem to have been constructed with the purpose of securing defense to the people who had been driven from the pueblos to the sides of the cliffs and remained there until they were driven altogether from the region.

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*Other villages like these were visited by Mr. Louis W. Gunckel and W. K. Moorhead. They are situated in the various box canyons west of the McElmo. Names were given to them which were as fanciful as those mentioned above. Monarch's Cave, Eagle's Nest, Giant's cave, Hawk's Nest Cave, Boulder Castle, Cold Spring Canyon, Ruins in Cottonwood Gulch, Ruins in Allen Canyon, Cliff House A, Cliff House B, Cliff House Nos. 6 and 7, Cliff Dwelling Nos. 11, 12, 13, Ruin Canon—they all have the same characteristics of the cliff houses or cliff builders in the Mancos Canyon, but are generally smaller and more completely ruins. They are mainly situated in the side of the cliff and have walls to protect them from an invading enemy. In a few cases there are separate houses on the summits of the cliffs which have a very modern look, as they are built with square rooms and rectangular doors, the most of them two stories high. Those on the cliffs may possibly have been built after the advent of the white man, though this is a mere conjecture.

It has been held by a few explorers that there were no fortresses among the cliff-dwellings or pueblos; that what appear to be such were the "summer homes" of a people who resorted to the valleys for the purpose of cultivating the soil, and who built their houses in the ledges to protect themselves from floods and the assaults of enemies. This opinion is not held by many, but as it is advanced by Mr. C. Mindeleff and other explorers connected with the Ethnological Bureau, and has been published in their reports, we give it here.* The following is the language:

> The study of the ruins in Canyon de Chelley has led to the conclusion that the cliff ruins there are generally subordinate structures, connected with and inhabited at the same time as a number of large home villages located on the canyon bottoms, and occupy much the same relation to the latter that Moen-Kepi does to Oraibi, or that Nutria, Pescado and Ojo Caliente do to Zuni, and that they are the functional analogues of the "watch towers" of the San Juan and of Zuni and the brush shelters of Tusayan. In other words, they were horticultural outlooks occupied only during the farming season. It might be expected that the Canyon de Chelley ruins would hardly come within the scheme of the classification with those found in the open country; for here, if any where, we should find corroboration of the old idea that the cliff ruins were the homes and last refuge of a race harassed by powerful enemies, driven to the construction of dwellings in inaccessible cliffs, where a last ineffectual stand was made against their foes; or the more recent theory that they represent an early stage in the development of Pueblo architecture, when the Pueblo builders were few in number and surrounded by numerous enemies. Neither of these theories are in accord with facts. A still later idea is that the cliff-dwellings were used as places of refuge by various pueblo tribes, who, when the occasion of such use was passed, returned to their original homes, or to others constructed like them. This makes plain some of the cliff ruins, but if applicable at all to those in de Chelley, it applies to only a small number of them.

The same author says there are great differences in kind between the great valley pueblos, located without reference to defense, and depending for security on the size and number of their population, of which Zuni and Taos are examples, and the villages which are located on high mesas and projecting tongues of rock; in other words, on defensive sites, where reliance for security was placed on the character of the site occupied, such as the Tusayan villages of to-day.

> Doubtless in the early days of Pueblo architecture, small settlements were the rule. Probably these settlements were located in the valleys, on sites most convenient for horticulture, each gens occupying its own village. Incursions by neighboring wild tribes or by hostile neighbors, and constant annoyance and loss at their hands, gradually compelled the removal of these little villages to sites more easily defended, and also forced the seggregation of various related gentes into one group or village. At a still later period the same motive compelled a further removal to even more difficult sites. Many villages stopped at this stage. Some were in this stage at the time of the Discovery;--Acoma for example. Finally, whole villages, whose inhabitants spoke the same language, combined to found one larger vil-

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*See 16th Annual Report of Bureau of Ethnology, "The Cliff Ruins of Canyon de Chelley," by Cosmos Mindeleff, p. 79-198.

Courtesy of Santa Fe Railroad.

THE HIDDEN TRAIL AMONG THE MOUNTAINS.

CLIFF HOUSE IN WALNUT CANYON.

> lage, which depending now on size and numbers for defense, was again located on a site convenient for horticulture. These constitute the large "communal houses," the distinguishing characteristics of which are as follows: Each building consisted of an agglomeration of a great number of small cells,without any larger halls of particularly striking dimensions. All the buildings, except the out-houses or additions, were at least two stories high, and often several stories high. The lower story was entered only from the roof. A dead wall without windows was the only defense. The various stories receded from the bottom to the top, and were reached by ladders.
>
> The estufa, or kiva, often circular in form, but some times placed within square walls, the corners fillled in,making them circular inside and square outside, was another important element.
>
> The ruins of de Chelley show unmistakably several periods of occupation extending over considerable time, and each comparatively complete. They fall easily into the classification suggested by Mr. G. Nordenskjold.*

In the description given by Mr. Mindeleff the following classification has been employed:

1. Old villages on open sites.
2. Home villages on bottom lands.
3. Home villages located for defense.
4. Cliff outlooks or farming shelters.

This classification is, in the main, correct, but it would be better if it could be made to emphasize the fortified character of the third class, namely, the "home villages located for defense,"for these are the structures to which we give the name of "Cliff Fortresses." We maintain that they mark a period in the history of all the pueblo tribes. It was probably the same period in which the tribes on the Rio Grande, on the Zuni river and other localities in the interior were compelled to build their villages on the summits of the mesas, a few of which are still occupied, but the majority of them are in ruins. It was a period which preceded the advent of the Spaniards, but was subsequent to the incursions of the wild tribes, such as the Apaches, Comanches and Navajoes, the date of which cannot be determined.

There may have been a period before the incursions of these tribes, and at intervals during the time of their presence, when the people occasionally built houses in the side of the cliffs as summer homes.

This may be true of certain localities which are found west of the Grand Canyon, in Colorado, for there are here what Maj. J. W. Powell calls "haciendas" or agricultural settlements.

It may also be true of certain localities in the valleys of the Gila and Rio Verde, and other streams which furnish rich soils on their borders, but are likely to overflow the lands at certain seasons of the year. It was the custom of the Pueblos, who dwelt on the mesas, to go long distances away, and raise their crops. In such a case they would often build temporary houses as their summer homes. But these houses, which were erected on the high points which overlooked the streams, are generally made with one, two, or three rooms, and are scattered here and there, and look like a straggling village. They served the same purpose as the cavate houses which are so nnmerous in the valley of the Rio Verde and are near the irrigating ditches which are so celebrated in these localities.

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*Mr. Nordenskjold's classification of the ruins in the Mancos Canyon and Mesa Verde region is as follows: 1. Ruins in the valleys or on the plains or on the plateaus. 2. Ruins in the walls of the canyons, subdivided as follows: (a) Caves inhabited without the erection of any buildings—cave dwellings; (b) cliff-houses or buildings erected in caves.

The villages on the bottom lands, and the cavate houses in the sides of the cliffs are not to be confounded with the permanent villages on the mesas. Nor are they to be confounded with the cliff-dwellings which are so numerous in the Mancos Canyon and the Canyon de Chelley and other places. We call these "cliff fortresses" to distinguish them from the high houses and the cliff palaces, and the ordinary pueblos. They are villages and have all the conveniences and necessities of the pueblo villages, whether situated on the valleys or on the mesas. Yet the provisions for defense are so conspicuous and so preponderate over the provisions for dwelling places, that we must regard them as "forts" in which the defenders have gathered their families in order to protect them from the incursion of lurking foes. They may be supposed to mark a period in the history of the Pueblo tribes, but a period concerning which little is known.

The history of the Cliff-dwellers is as follows: First, the great communistic house, built after the honey-comb pattern, either on the mesas or in the valleys, furnished with estufas, a lookout tower, and various signal stations on the heights around. Second, the building of the village or fortress in the sides of the cliffs, with the store houses in the rear instead of in the lower apartments, the passageways between the dwellings and the sides of the cliffs, with the estufas on the terraces in front, with towers either at the end or in the central part, and rooms furnished with loop-holes for shooting arrows at the assailants.*

There was a third period in the history of the San Juan valley in which the people were driven from their villages, their clan organization was broken up, and society was disintegrated. Those who remained were compelled to build separate houses high up in the sides of the cliffs, protecting their families as best they could. About the only unity there was to the tribe or clan, consisted in giving the alarm when an enemy came in sight, and having signal stations and towers on all the high points, and cultivating the valleys in bands, whose only safety was found in separation and flight to the so-called "high houses."

A fourth period was that which followed the advent of the

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*The same period was marked in other localities by building the pueblos on the summits of the high mesas and protecting them by dead walls around the lower stories. There were localities in which no mesa could be reached and the people were compelled to fortify their villages by enclosing them in a great wall, making passage-ways between the buildings, so giving the village a checker-board fashion but providing a central citadel or tower which served also as a temple, making this the last place of refuge in case of assault and disaster.

Spaniards, in which certain tribes in the west part of the valley seem to have built separate houses and square towers on the edges of the cliffs. At least houses have been discovered and described by certain explorers which are separate from one another and have a very modern look. It is possible that they were erected after the advent of the white man, though there is no record of this. They have been long unoccupied, but are in a fair state of preservation.

It is the middle period which most interests us, for at this time nearly all of the so-called fortresses were erected. These fortresses were not confined to the sides of the cliffs, but were built upon the mesas, and were the permanent villages of the people during the time of invasion. There may have been villages in the valleys, built after the "great house" pattern, good specimens of which are still found in the valley of the Chaco, but the fortresses on the mesas and in the sides of the cliffs were also permanent villages. The summer homes were composed of isolated houses which were scattered among the cliffs, or were built upon the slight elevations, but did not often possess the component parts of village architecture, such as estufas, towers, store houses and tanks, or reservoirs.

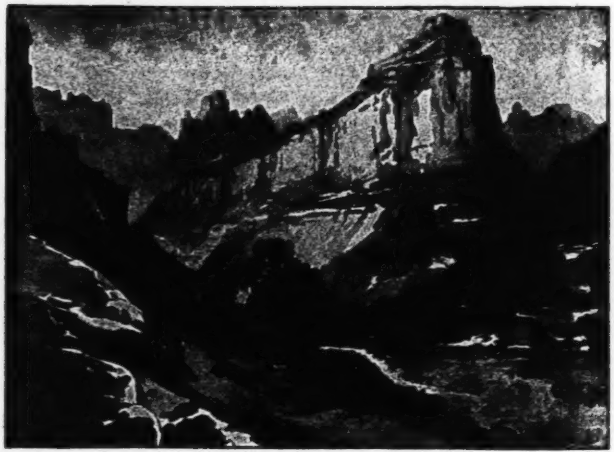
The point which we make is that there were fortified villages or fortresses which possessed all the elements of a regular pueblo, and were occupied as permanent abodes, and not as a temporary resorts. They were not mere refuges for the people in the time of attack, nor summer homes for an agricultural people. We must regard them as fortresses, or fortified villages, which the defenders built for the purpose of protection from the incursions of lurking foes, into which they gathered their families and their stores of provisions and personal possessions, making their inaccessibility the chief means for defense. They made them strongholds which they occupied permanently. They mark an early period in the history of the people—a period concerning which scarcely anything is known. About the only evidence is that which is found in the peculiar style of architecture and the human remains which have been discovered.

Some have supposed that this condition of affairs was peculiar to certain localities, and was mainly prevalent in the "swarming place" of the Pueblo tribes, namely, the valley of the San Juan, but the evidence is that it was spread over the entire pueblo territory and that all the tribes passed through the same experience. It is probable that the people on the San Juan and its tributaries bore the brunt of the attack of the enemies which came down upon them from the mountains of the north, and were compelled to take refuge in the cliffs. It would seem, however, that there were wild tribes surrounding the entire pueblo territory and that they constantly beset the villages which were on the edges, and first compelled them to fortify their homes, and afterwards drove them from these outlying fortified posts towards the center of the territory.

It will be understood that there were among the Cliff-dwellers and Pueblos various methods of defending their villages, each one of which was adapted to the particular region in which they were placed. These may be classified as follows:

I. In the region where the Cave-dwellers had their homes the main dependence was upon the "lookout," or, in other words upon the view furnished from their homes in the cliffs.

There are many specimens of this kind of fortress, some of which may be found on the summits of the San Francisco mountains and in the midst of the craters of the extinct volcanoes.



ISOLATED CLIFF NEAR FLAGSTAFF.

Others are found in the midst of the Potreros and high isolated mesas which are situated in the valley of the Rio Grande. The best example of this class will be found in the two isolated buttes or mesas which are called Shufinne and Puye. The following is Mr. Bandelier's description of these:

> The Shufinne contains a complete cave village, burrowed out of the soft rock by the aid of stone implements. The other specimen of artificial cave-dwellings is separated from it by a distance of only three miles. Here is quite a large pueblo ruin, two stories high, that crowns the top of the cliff, but at Shufinne the buildings lie at the base of the cliff which looms up conspicuously like a bold white castle. There are scattered groups of caves near by, some of which extend at intervals on a line nearly a mile long, and in some places beams protrude from the rock, showing that houses had been built against it along side the cave dwellings.
>
> As lookout places both cliffs are magnificently situated, commanding in every direction a superb view. The Rio Grande valley is visible from north of San Juan to San Ildefonso, and from Santa Clara to the gorges

of Chimago. The whole eastern chain stretches out in the distance from Taos to its most southerly spurs below Santa Fe. In case of imminent danger the inhabitants of one rock could signal to those of the other, night or day, as there was nothing to obstruct the view. The ascent to the caves is tedious, for the slope is steep and it is tiresome to clamber over the fragments of pumice and tufa that cover it. Once above, we find ourselves before small doorways, both low and narrow, a single door which sometimes serves as an entrance to a group of as many as three cells, connected by short, narrow and low tunnels, large enough for a small person to squeeze through. There were little air-holes, or possibly loop holes, in the outer walls but no fire places, although the evidences of fire are plain in almost every room.

Every feature of a pueblo household is found in connection with these caves. As defensive positions they were free from danger from assault by an Indian force. Only an ambush prepared under a cover of darkness could injure those who had descended from their lofty abodes, in order to fetch water or till the fields. Nevertheless, constant harassing might at last compel the inhabitants to abandon even such impregnable positions.* Cave villages of this kind are quite numerous, occupying an area of about 300 square miles.

CAVE FORTRESS NEAR SAN FRANCISCO MOUNTAIN.

West of the Rio Grande, in the vicinity of the Rito de Los Frijoles, there are deep canyons which traverse the country like gashes several hundred feet in depth. In the cliffs of this romantic valley the largest and best preserved cave villages are to be seen,--capable of accommodating 1,500 people.*

Wherever the caves stand without pueblo ruins in their immediate vicinity, they show almost exclusively the old, old kinds of potsherds—the black and white, or gray, and corrugated. This would seem to indicate that the artifical caves and the small houses belong to one and the same period, anterior to that of the construction of the many storied pueblos.†

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*See Final Report of Investigations among Indians of S.W. U.S. Part II, p. 74.

†See Ibid, p. 160.

Cave villages of this kind have been described by Mr. C. F. Lummis, as situated among the "Potreros," and in the deep canyons just west of the Rio Grande; and attention is called to the remarkable stone idols, or effigies, which are supposed to be the totems of this people.

One of the best specimens of a fortress situated so as to command an extensive view is the one which is represented in the cut which has been kindly furnished by Mr. C. A. Higgins, of the Santa Fe railroad, who describes it as follows:

> Nine miles from Flagstaff, and only half a mile from the stage road to the Grand canyon, cave buildings are to be seen, whose slopes are buried deep in black and red cinder. The caves, so-called, were the vent-holes of the volcano in the time of the eruptions of lava and ashes that have so plentifully covered the region for many miles about. Countless ragged caverns, opening directly under feet and leading by murky windings into unknown depths in the earth's crust. Many are simple pot-holes a few yards in depth, then subterranean leads, choked up and concealed. Others yawn black, like burrows of huge beasts of prey. In many instances they are surrounded by loose stone walls, part of which are standiug just as when their singular inhabitants peered through the crevices at an approaching foe. Broken pottery abounds scattered in small fragments, like a talus, to the very foot of the hill. The pottery is similar to that found in the cliff-dwellings. It is probable the Cave-dwellers and the Cliff-dwellers were the same people. The coarser vessels are simply glazed or roughly corrugated; the smaller ones are decorated by regular indentations in imitation of the scales of the rattlesnake, or painted in black and white geometric designs.

II. The commonest form of defense was to place the village or "great house" upon a high and isolated mesa, and make the situation itself the source of security, but even in such cases there were special provisions for defense in the arrangement of the rooms above the terraces, leaving the lower story without any entrance.

This was the peculiarity which the Spaniards noticed* in all the pueblos, though some of them were more difficult to approach than others. Taos, Laguna, Acoma, San Domingo, all of them located in the eastern part of the pueblo territory, in the valley of the Rio Grande, occupied such isolated positions that the Spaniards found it difficult to conquer them, and some of them they never did wholly conquer.

The early American explorers were impressed with the defensive character of these isolated villages, and have often described them[*]

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*The story of Coronado's march was told by four persons who took part in it; Mendoza, Jerramillo and an anonymous writer and Castanedo. The following quotations will show the impressions formed:

"Acuco was discovered by Alvarado in 1540, who described it as "situated on a precipitous cliff so high that an arquebus ball could scarcely reach the top." "Situated on the top, the only approach was by an artificial stairway cut in the rock of nearly 300 steps, and for the last 18 feet only holes into which to insert the toes." "Three days farther west brought them to Tiguex, containing 12 villages, and situated on the banks of a river." Continuing his journey five days more he reached Cicuys, "which he found to be a strongly fortified village, and consisted of four story-terraced houses built around a long square. It was also protected by a low stone wall and was capable of putting 500 men into the field. "Coronado and his troops also reached this rock. They climbed the heights of Acuco with great difficulty, but the native women accomplished it with ease. At the end of the first day's march from Acoma they rested, where was "the fairest town in all the province, in which were private houses seven stories high." Probably Laguna.

An excellent summary of the various fortifications, or fortified villages, which may be found in the pueblo territory, has been given by Mr. A. H. Bell, an English gentleman, who accompanying the surveyors of the Southern Pacific railroad, afterwards wrote a book entitled "New Tracks in North America." In this book he furnishes a description of the country and its topography, giving the elevation of the mountain peaks,[†] the amount of territory drained by the different rivers,[‡] the barriers[‖] which separate the different river valleys, the pueblos in this region and the population of each. He also quotes from Prof. J. S. Newberry, who accompanied one of the earliest exploring parties, that of Captain McComb, and who described the pueblos which he visited.

The ruins described by Mr. Bell were situated in the different districts, namely: on the Rio Grande and its tributaries; on the plateau where the Zuni and Tusayan tribes still live; on the Rio Verde and Little Colorado north of the San Francisco mountains; in the valley of the Gila and its tributaries; and, lastly, in Sonora, where are the ruins of the Casas Grandes. We give his descriptions of the first three or four localities, and leave the fortress of Sonora for another time.

The isolated pueblos which lie at a considerable distance from the main valley of the Rio Grande are very different in appearance from the simple one story buildings which are occupied by the natives. Laguna is built on the summit of a cliff some forty feet high, and possesses several natural advantages for defense. Acoma is a large village on the summit of a flat mesa, whose perpendicular cliffs rise to the height of from 300 to 400 feet. The ancient pueblo Taos consists of a compact fortress formed of terraces, seven stories high, and built on a rock overlooking a stream.

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[*] The following are the American writers and the dates of their publications:
Wm. H. Emory, in 1846-7, wrote to Albert Gallatin, then secretary of state, that he had met with an Indian race living in four-story houses built upon rocky promontories, inaccessible to a savage foe, and cultivating the soil. His description was confirmed by Lieutenant Albert. Mr. Gallatin contributed to the transactions of the American Ethnological Society [Vol. II, p. 111. 1848] an article on the subject, and Mr. E. G. Squier at the same time contributed to the American Review an article on the Ancient Monuments and the Aboriginal Semi-Civilized Nations of New Mexico and California. Mr. Squier identified Cibola with Zuni. Lieut. J. H. Simpson, in his Journal of Military Reconnoisance from Santa Fe to the Navajo country, gave a detailed description of the ruins in Chaco valley, also in the Rio de Chelly, and of the inhabited pueblos of the Zunis. Lieut. A. W. Whipple and W. W. Turner published, in the reports of the Pacific railroad survey a description of the same pueblos. H. M. Breckenridge, in 1857, maintained that Cibola was the well-known "Casa grand" on the Gila. R. H. Kerns, in 1854, and Henry Scoollcraft, in their "History of the Indian Tribes in North America" [Vol. VI, p. 70], upheld the Zun-theory. In the year 1869, W. H. Davis published a book in Doylestown, Penn., entitled "Ei Gringo; also the Spanish Conquest of New Mexico," and agreed with the above writers. L. H. Morgan thought he identified Cibola in the "remarkable group of ruined stone structures" in the valley of the Chaco, as being the seven citiee of Cibola, and published an article in the North American Review, in 1869, to that effect. H. H. Bancroft, in his "Native Races," adopted the Zuni theory. The same view was held by L. Bradford Prince, chief justice of New Mexico, in his historical sketches of New Mexico from the earliest records to the American occupation, in 1888 [131 pp.]

[†] Fremont's Peak, 13,570 feet; Long's Peak, 13,575 feet; Mt. Lincoln, 17,000 feet; Santa Fe, 6,846 feet; Albuquerque, 5,033 feet.

[‡] The square miles embraced in the Columbia river valley, 230,000; the Colorado river, 200,000 the Rio Grande, 210,000; the Great Basin, 282,000; the Mississippi river, 1,400,000.

[‖] The country from the Gila eastward rises step by step and mesa upon mesa. Upon the edges of several of the mesas may be found interesting fortified towns. In the interval between Fort Defiance and the Rio Grande rises Mount Taylor which, like San Francisco mountain, has broken through the sedimentary strata and poured over them floods of lava, which are as fresh as if ejected yesterday. Between the headwaters of the Rio Gila and Colorado Chiquito is a very elevated tract known as the "mogollon escarpment."

Venegas, Coronado, and all the early Spanish explorers in New Mexico, have described a number of many storied fortresses which are now no more.* Those mentioned with the exception of Zuni and the seven Moqui villages, are the only native fortresses which now remain.

Pecos was a fortified town of several stories. It was built upon the summit of a mesa which jutted out into the valley of the stream, and overlooked the valley for many miles. The Spaniards lived there until the middle of the last century. A few natives remained and kept alive the sacred fires in the estufas. The wild Indians of the mountains finally attacked the place and left Pecos desolated.

ISOLATED FORTRESS.

There are many ruins situated northeast from San Francisco mountain, located on the summit of the mesas. They are mostly three stories high with a court common to the whole community forming the center. The first story or basement consists of a stone wall fifteen feet high, the top of which forms a landing, and a flight of stone steps leads from the first to the second story.

Further to the northwest, and nearer to Colorado, is a group of pueblos larger than those of the Moquis, but situated like them on the flat summits of mesas but containing estufas, reservoirs, aqueducts, terraces and walls of buildings at least four stories high. No traces have been found of the former inhabitants. At Pueblo Creek are the remains of several fortified pueblos, crowning the heights which command Aztec pass.

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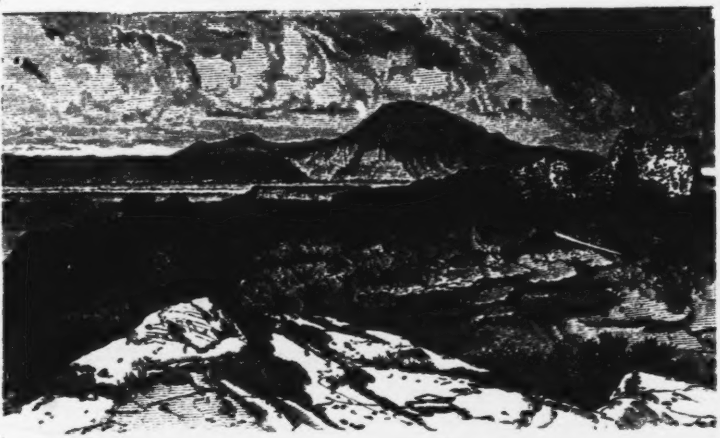
*The ruins may be classed under three heads:

1. Ruins of many storied strongholds.
2. Ruins, the foundations of which only remain.
3. Ruins of buildings constructed under Spanish rule,

Under the first class, which are east of the Rio Grande, there are four ruined villages which were fortified.

The ruins on the Rio Verde are worthy of notice. The river banks were covered by ruins of stone houses and regular fortifications which do not appear to have been inhabited for centuries.

In this connection it may be well to recall the villages which were situated on the Rio Grande, and which belonged to the same system with those which have been described, but have so long been unoccupied, that they have been called by Mr. C. F. Lummis, the cities that were forgotten.



RUINED PUEBLO ON A MESA—WITH OUTLOOK.

These seem to have been fortified towns. They are called by the general name of Gran Quivira. They were occupied by the Spanish missionaries but were finally overthrown by the savages and are now in ruins.

Near Quivria Mr. Bandelier discovered a bold eminence which bears the remains of a pueblo in which the rooms were disposed in a circle around the top of the hill and two estufas, and not far from the village an artificial pond. He says:

What could have induced the Indians to settle and remain in a region where they had to forego the great convenience of a natural water supply? It was the result of being driven back from other points. The ruins on the Madano were all provided with artificial reservoirs. This was not a device peculiar to Quivira, but one that was generally adopted by the Pueblo Indians of that region. All over this arid region the villages relied upon such contrivances as they do to-day at Acoma. Every pueblo on the Madano stands so as to be easily defended and to afford excellent lookouts.

They are all specimens of that peculiar kind of Indian defensive positions in which the absence of obstacles to a wide range of view becomes a main element of security. The roving Indian seldom could have taken a pueblo by surprise, still less by direct assault against both the villages on the Medano. The villages were almost impregnable. Against persistent attacks on a small scale the sedentary Indian could not long hold out.

The same kind of fortressses is common in the region around Zuni, though the most of them are in ruins. There are two pueblos on the summit of "Inscription Rock." The Zunis claim that they were their villages but were abandoned previous to the appearance of the Spaniards.

General Simpson has furnished a plan and description of one of these ruins. He says:

> These ruins presented in plan a rectangle of 206 by 307 feet, the sides corresponding to the four cardinal points. The apartments seem to have been chiefly upon the contour of the rectangle, though the heaps of rubbish within the court show that there had been here some also. The style of the masonry, though resembling that of the pueblos of Chaco, is far inferior in beauty of its details.
>
> About 300 yards distant, a deep canyon intervening on the summit of the same massive rock, upon which the inscriptions are found, we could see another ruined pueblo, in plan and size similar to that I have just described. The situation of the ruins is a good one for defense and for observation, since they are perched on a plateau over 200 feet in height, the sides of which are everywhere steep and absolutely vertical on the north and nearly so on the east.[*]

There are ruins upon the summit of Thunder mountain called To-yo-a-lan-a, which rises 900 feet above the plain, in precipitous crags. Ascent is possible on four trails only, the most of which are of frightful dizziness. The mesa is four miles long and from one to two miles wide. The top is partly covered with low woods. There is tillable soil and permanent water in tanks, so that it could furnish room and subsistence for a moderate Indian population. The ruins mark the sites of six small villages. They date from the year 1680 and 1692, and were erected during the absence of the Spaniards when the Navajos threatened to destroy the tribe. Sacrificial caves, in actual use, are quite numerous, and hosts of legends and folk-tales cluster around the towering table-rock. The village, which was first seen by Coronado and which he had to take by storm, was called "Ahacus" by Fray Marcos, and is now called "Hauicu." It is an elongated polygon on a rocky promontory, overlooking the plains that stretch out on the south side of the Zuni river and about fifteen miles southwest from the present Zuni. The polygonal shape was a favorite one in the Zuni villages.

Mr. Bandelier speaks of many ruins of this type:

> It implies a circumvallation of polygonal shape with one or more gateways. The circumvallation forms a building with a number of cells, the entrances to which were from the inside, while the outer front was probably perforated only with loop-holes. This polygonal house enclosed an

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[*] See Journal of Military Reconnoisance, 1850, p. 221. Also Bandelier's Final Report, Part II p. 29.

open space containing estufas, and sometimes a cluster of other buildings, so that the whole consists of a central group surrounded by a ring of many storied edifices which form a defensive wall. The prevalence of the polygonal pueblo in the Zuni country must therefore be ascribed to other than physical influences, and it seems as if a protracted state of insecurity might be the cause of it.

Mr. Higgins also speaks of ruins on the summits of isolated mesas, and illustrates them by two very striking engravings.

> At several points upon the rim of the Grand canyon the razed walls of ancient stone dwellings may be seen. They are situated upon the verge of the precipice, in one instance crowning an outstanding tower that is connected with the main wall by only a narrow saddle, and protected on every other hand by the perpendicular depths of the canyon. The world does not contain another fortress so triumphantly invulnerable to primitive warfare, nor a dwelling place that can equal it in sublimity. It would be found upon one of the salients of Point Moran.
>
> Scattered southward over the plateau other ruins of similar character have been found. Perfect specimens of pottery and other domestic utensils have been exhumed.
>
> The most famous group and the largest aggregation is found in Walnut canyon, eight miles southeast from Flagstaff.* This canyon is several hundred feet deep and some three miles long, with steep terraced walls of limestone. Along the shelving terraces under beetling projections of the strata, are scores of these quaint abodes. The larger are divided into four or five compartments by cemented walls, many parts of which are still intact. It is believed that these ancient people customarily dwelt upon the plateau above, retiring to their fortifications when attacked by an enemy.
>
> Inferentially these mysterious people, like the Cliff-dwellers, were of the same stock as the Pueblo Indians of our day. How long ago they dwelt here cannot be surmised, save roughly, by the appearance of extreme age that characterize many of the ruins, and absence of the strange native traditions concerning them. Their age has been estimated at from 600 to 800 years.

III. Another method of defense was one which consisted in the erection of towers or citadels, some of which were square, others round. Mr. Lummis has described a "rectangular house" situated southwest of the Chaco group, called Pueblo Alto. It measured some 200 feet long from north to south and 100 feet from east to west. He says:

> The walls on the west side are said to be still thirty, forty and forty-five feet high. Just in the center of this side is the distinctive wonder of the whole pueblo—a great tower, square outside, round within, with portions of its fifth story still standing. The walls still hold the crumbling ends of the beams to the successive stories, and the loop-holes in the two lower stories are plainly visible. There are at present no traces of water in the vicinity, but the pottery seems to be of the same kind as that found in the Chaco ruins.†

These ruins are near the extinct volcano called San Mateo, or Mt. Taylor, the summit of which is 11,391 feet high. The valley of the San Mateo is a narrow basin along the wooded northern slopes of the Sierras; bare hills extend to the north of it, and to the east lies a bleak pass. The soil at San Mateo is fertile. Woods near at hand and a diminutive creek furnishes the water supply. Mr. Lummis speaks of the beauty of the pottery and the originality of decoration. There were bowls of indented pottery, one-half of the interior smooth and handsomely painted, covered with combinations of well-known symbols of Pueblo Indian worship, Shell beads, stone axes, metates and arrow heads were numerous.

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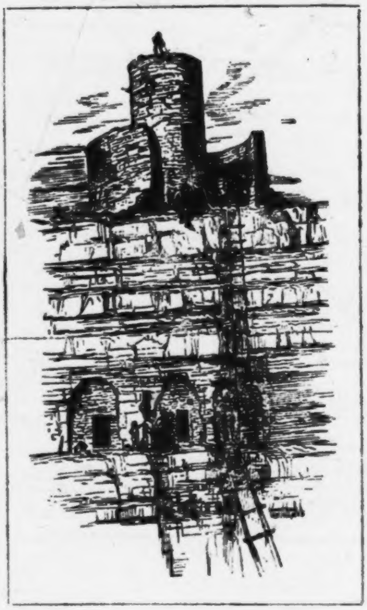
*These engravings were drawn by Thomas Moran, who, perhaps, sacrificed strict scientific accuracy to his artistic taste. They represent the scenery vividly, but the picture of Walnut canyon differs somewhat from the photographs which have been taken.

†See Bandelier's Final Report II.

In this region, a few miles north of McCarthy's, rises an elliptical mesa called the "Mesita Redonda." Its height is 113 feet. The rock is sandstone, its top flat. It measures 76 metres by 45 metres. On the summit is a structure consisting of nineteen regular rectangular cells, built on three sides around what may have been a circular watch tower, the diameter of which is nearly 30 feet.



TOWER ON THE SAN JUAN.*

Extensive ruins are found below, also pottery of the ancient red and black type. All appearances favor the presumption that the remains on the top of the little butte and the more extensive ones at its foot formed but one settlement. It may be that the circular edifice was a watch tower or it may have been the estufa belonging to the people who occupied the 19 cells built around it.

The Mesita afforded an excellent point for observation and a place of refuge in case of dire necessity. Below there is at least one estufa, and also a large round depression, 41 feet in diameter, which may have been a tank. It was an exceedingly favorable spot for an aboriginal settlement, for there was water near by and wood, and the soil was fertile.

Other towers which were used for lookouts as well as for fortresses are numerous. Mr. Bandelier says of them:

> The frequency of round or circular structures have often been noticed by investigators. The interior is formed by a circular room and around this

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*This Tower has been described by W. H. Holmes. See Chapter VI, p. 91.

is built a ring divided transversely by a number of cells. While the ordinary round-towers occur almost everywhere over the pueblo area, this more complex structure seems to be a feature peculiar to the extreme northwest of New Mexico and the adjoining sections of Colorado and Utah.†

Cliff houses and round-towers exist northwest of Fort Wingate. Two story watch-towers, of stone, were discovered in the vicinity of Zuni which were square instead of round. A stone staircase, built outside from the ground, leading to a small doorway in the upper story, characterized the "Round-towers." Some of those at Fort Wingate had the walls built in steps and terraces, receding from below upwards like the stories of pueblo houses. Transverse beams supported the free ends of a number of poles like spokes of a wheel, resting loose on the axle, the other ends were imbeded in the walls and the poles supported the usual layers of brush and earth, or making circular balconies. Such tower-like constructions are not always to be looked upon as strictly military. The square towers around Zuni are built for guarding the crops and not for the use of a small garrison. Nevertheless every one of the small buildings had contiguous to it a circular depression which the Navajos say was a tank. One of these had sixteen cells.

Not only were the towers near the enclosures but within the enclosures themselves, and often formed citadels. This is especially true of pueblos built in a checker-board pattern of irregularly alternating houses and courts. There are striking resemblances between these citadels, which form so prominent a feature in the walled towns of the far west, and those which are so common in the ancient "walled towns" of oriental and bible lands. There is also considerable likeness between the structures upon the mesas and the old "castles" which in feudal times crowned the summit of the hills and mountains in central Europe.

These pueblos are virtually closed on all sides, either by the walls of houses or by separate walls; they are very defensible, as there are but one or two entrances, and these either by a narrow passage between two buildings or a narrower one with re-entering angles between two court walls.

Each village contains one or more open spaces of large size, but they are irregularly located, the tendency being to cut up the whole plat into as many small squares as possible.

In addition to the court yards connected with these edifices, there are frequently enclosed spaces on the slope, which would not permit of the erection of buildings. These were probably garden beds, and were placed near the dwellings as a measure of precaution in time of danger. They were above the line of irrigation by the arroyas, but the remains of acequias in the bottoms prove that these were used for cultivation. They were without defense.

The type of village which includes a larger and more substantial structure grows more conspicuous as we ascend the course of Tonto creek; the checker-board-village-type is quite plain. A fine specimen of the kind is noticed at San Carlos, Wheat Fields, and Armours. A quadrangular wall 8½ feet thick surrounds the central mound and the space thus enclosed is connected with the main structure by walls of stone dividing it into squares and rectangles. It is still the checker-board-type; but the dwellings have mostly been consolidated into one central mass, from which enclosures diverge towards the circumvallation. Every village contained a larger and higher eminence, sometimes in the center and sometimes at the side.

There are indications in some places that the house was erected on an artificial platform, but the central building can not compare with the communal house. The ruins around Fort McDowell and Fort Reno are of this type. Remains of irrigating ditches are quite common—some of them as long as twenty miles. The width of the acequia is about two feet, and the depth about two feet. In addition to these canals, artificial tanks begin to appear. They are elliptical and the rim is formed of stones, or by an embankment of earth of considerable thickness. They run mostly parallel to the streams, but transverse acequias have also been discovered. I always found the tanks in the vicinity of ruins, and more or less distinctly connected with ancient canals.

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†See Holmes report in Hayden's Survey in 1876, p. 388, and plates; also Morgan's "Houses and House Life," p. 191; also the chapter on "High Houses and Ruined Towers."

Mr. Cushing says of these canals in the Salado and Gila valleys:

> They were found varying in length from ten to eighty miles, and in width from ten to eighty feet. Each canal, whether large or small, was found on excavation to have been terraced, that is the banks of dirt thrown out had formed a greater canal containing a lesser, which in turn contained another. They were so filled up and leveled in the course of centuries, that they were scarcely traceable.

Among the Pueblo Indians such works are communal enterprises carried on by all the men of the village, and performed at stated times. The villages situated on the same irrigating ditch used the same acequia and were contiguous, yet they were independent of each other for a long time. There was no evidence of a confederacy.

In connection with this class of fortresses, the Great Houses on the Gila, and Salado and Sonora, are to be mentioned again. Father Ribas, the historiographer of Sonora, says that the villages consisted of solid houses made of large adobes, and that each village had, beside a large edifice, stronger, and provided with loop-holes, which served in case of attack, as a refuge or citadel. Such a place of retreat, the Casa Grande and analogous constructions in Arizona, seem to have been. The strength of the walls, the openings in them, their cummanding position and height, favor the suggestion.

A wall of circumvallation to these villages shows that the enclosure and central area was a fortress.

Mr. Cushing claims that the central building was a temple. He speaks also of "pyral mounds" where had been buried a certain class of the dead of these cities, together with their numerous funeral sacrifices. Usually at the southern and western bases of these mounds were found great cemeteries containing from twenty to two, three, and even four hundred incinerary urns.

> The same excavation which revealed these features of a pyral mound also revealed the contiguous enclosing wall of what proved to be typical, very extensive, many-roomed dwellings. Not only from the discovery of totemic devices and forms of pottery, of which each one of these great blocks of dwellings contained always a distinguishing few, but also from the fact that each had outside of its enclosing wall, its own pyral mound, its

> great underground communal oven, and its still greater reservoir, fed by a special branch of the larger city viaducts or canals, it was inferable that each was the abiding place of a particular clan or gens.
>
> First in the temples, in what remained of the second and third stories, afterwards in the enclosed communal buildings, we found sepulchres. Those in the temples were built of adobe, shaped like sarcophagi. These in turn had been carefully walled in and plastered over, in order that the living rooms that contained them might still be occupied.

The best specimens of a Cliff Fortress is the one which is called Montezuma Castle. It was first discovered by Dr. W. F. Hoffman in 1876, but afterward was visited and described by Dr. E. A. Means.

It contained all the elements of a permanent "home village" or pueblo, and of a cliff fortress. Its position is almost inaccessible, but its manner of construction, especially the arrangement for reaching the upper stories, gave it unparalleled security. Its upper stories were furnished with battlements, showing that it was intended to be a fortress, and the details of its construction illustrate the skill and sagacity with which the Cliff-dwellers erected their fortresses.[*]

Mr. Hoffman calls it an imposing "cliff fortress." The following are his words:

> I say "fortress" from the fact that all the cliff-dwellings from this localilty upward, along the stream to Montezuma wells, contain but a single room, the dimensions of which vary from four to eight feet square, and from three to five feet high, and appear like swallow nests instead of habitations. The fortress is about 35 feet in height, each story receding several feet. The horizontal length of the front wall is about 50 feet, the walls being built nearly out to the face of the escarpment. There is a square tower in the middle front of the lower wall, through which I found the only means of access.[†]
>
> The roof of the second story forms a floor for a sort of parapet 4 feet high. Through this are several port-holes 3 or 4 inches square, on the inner side and over a foot on the outer side, through which arrows could have been very easily fired. Back of the parapet is a small opening leading into the rocks, which appears as if it might have been used as a store-room for food.
>
> The door or opening, partially visible in the upper postern wall, is the one leading to the supposed hearth and store-room. Two rafters protrude from the middle of the wall, which evidently served as a partial hold, or support. The lintels over the doorways are generally of cedar, and are in as substantial a condition as when first placed there. The stones composing the wall are neatly and closely laid and fitted, and actually cemented together with mortar. The place has become more accessible by the breaking away of the rocks than it was when regularly occupied, when rope ladders were probably in use.

The description by Dr. Means corresponds to that given by Dr. Hoffman, but furnishes some additional facts. It is as follows:[†]

> Of the cliff fortresses, as distinguished from the pueblos, many excel-

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[*] See Hayden's Report for 1876, p. 477.

[†] Mr. Holmes speaks of towers on the San Juan, which furnisned the means of access to the cliff-dwellings.

[‡] "Cliff-Dwellings on the Rio Verde," by Edgar A. Means, surgeon U.S.A., Popular Science Monthly, 1890, p. 744.

lent examples are found in the verde region. One, in which I was the firs white man to set foot, is built on the right wall of a deep canyon, between Hackberry Flat and the Rio Verde. The building known as "Montezuma Castle," on the right bank of Beaver creek, in sight of and three miles from Fort Verde, is the finest and is typical of its class.

This castle, doubtless a "fortress," is fitted into a natural depression, high up in a vertical limestone cliff, the base of which is 340 feet from the edge of the stream and about 40 feet above it. The casa, or fortress, is accessible only by means of ladders, its lowest foundation being 40 feet from the bottom of the cliff. After ascending three of these, a ledge is reached, upon which six cave-rooms open. On a ledge below this one, and 80 feet to the northeast, are two cave-dwellings neatly walled up in front, with a well-made window in each for entrance. One or two isolated chambers, walled in front and windowed, may be seen in the side of the cliff, where they are altogether inaccessible. These together constituted the settlement, or home village.

Ascending a fourth ladder, the "fortress" is reached. The foundation rests upon cedar timbers, laid longitudinally upon flat stones on the ledge. The projecting ends of these timbers show plainly the marks of stone axes, used in cutting them. The front wall is a little over two feet thick at the bottom and 13 inches at the top. The timbers are so placed that at the middle they project over the edge of the ledge. The fortress is entered at a projecting angle, through a window of sub-gothic form, measuring 3 feet 3 inches in height and 2 feet 4 inches wide at the bottom. The apartment is smoothly plastered within. The plastering shows the marks of the thumb and fingers and hand.

The roof is formed by willows laid horizontally across eleven rafters of ash and black alder; upon this a thick layer of reeds placed transversely, the whole plastered on top with mortar, forming the floor to the chamber above. The only means of entering the seventeen apartments above this room is a small hole in the ceiling, just within the entrance, measuriug 13 by 18 inches, bordered by flat stones laid upon the reed layer of the roof. These stones are worn smooth by the hands of the Cliff-dwellers, in passing two and fro. There is a store-room separate from the one just described, on the first floor. It can only be entered through a small scuttle in the room over it. The upper, third and fourth stories are further back than the first, after the pueblo style. The outer wall is built on a ledge in the rear of the second floor. The second story is much more spacious than the first, as the roof of the latter brings the building to the level of the ledge, which extends laterally in each direction and serves as a floor for additional rooms. This story is composed of a tier of four rooms, bounded behind by a massive wall of masonry which rests on a ledge with the floor. This arrangement, besides giving more room to the stories above, secures the greatest amount of stability to the wall, which is most important to the structure. It is 28 feet in height, rises to the fifth story, around the front of which it forms a battlement 4½ feet high, fortress like. It is slightly curved inward.*

The third floor comprises the most extensive tier of rooms in the structure, as it extends across the entire alcove of the cliff in which the Casa is built. The balcony above the second story has a battlement about it, supported by the wall of the room. The apartments of the fourth floor are rather neater in construction than the rooms below. The doorways are neatly executed, each having four good-sized lintel pieces,

The fifth story can only be reached by climbing through a small hole in the ceiling of the room below. This, the uppermost story, consists of a long porch, or gallery, having a battlement in front and an elevated backward extension on the right. The two rooms on this floor are roofed by the cliff, and are loftier than the lower chambers.

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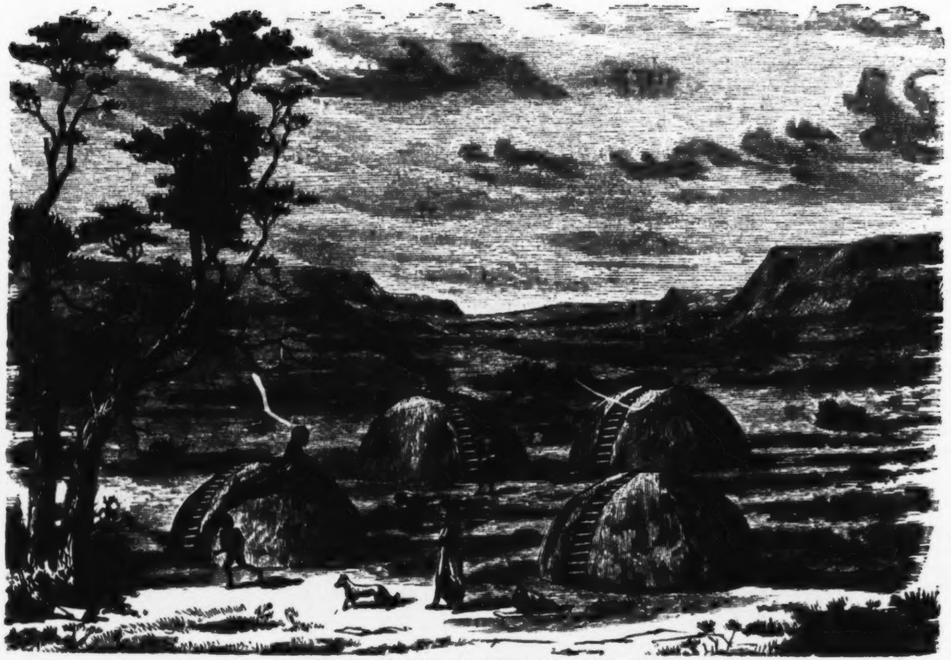
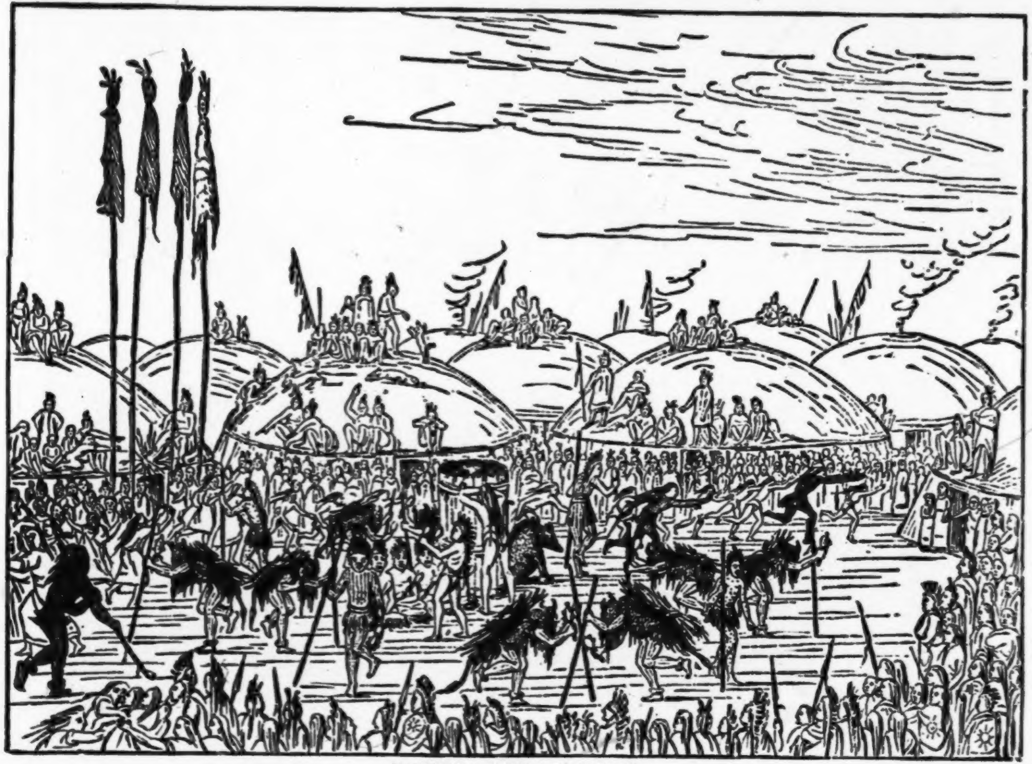
*The most of the walls which form the fortress in the cave villages are curved outwards. Such is the case in Monarch's Cave and elsewhere.



HOUSES OF THE CALIFORNIA INDIANS.

**These mud-covered, domed-shaped houses are common on the great plains of Sacramento and San Joaquin, and are characteristic of California; The entrance is generally on the top and remind us of the entrance of the Kivas common among the Cliff-dwellers.**



HOUSES OF THE MANDANS.

These houses are made with a timber frame and are covered with dirt. The scene represents the Feast which symbolizes the Creation, and the Deluge, and the Big Canoe.

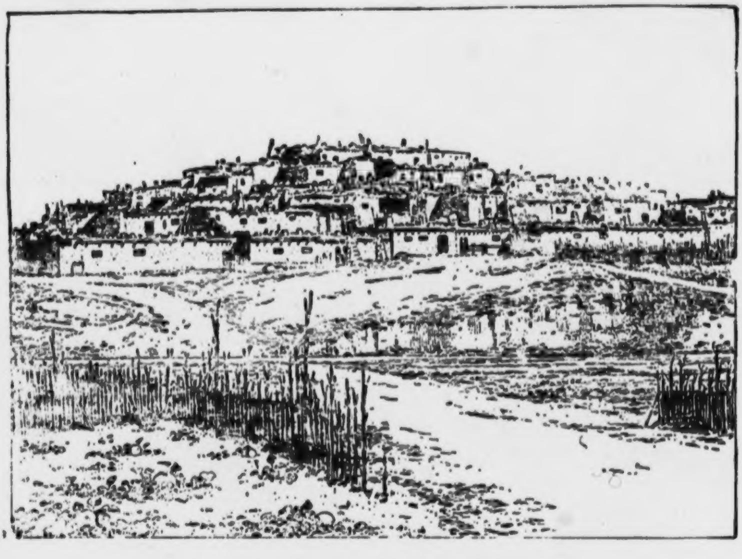
# CHAPTER XII.

## GREAT HOUSES AND FORTRESSES.

The chief features of the architecture of the Pueblos and of the Cliff-Dwellers was that one great house always held a village, and constituted not only a home for all of the people of the village, but also a castle or house-fortress for them. There are other regions where villages are crowded into small clusters of houses, and the people make a common defense either by massing their forces or by surrounding their houses with a stockade or an earth wall. Such was the common mode of life among the tribes in the Mississippi Valley—such as the Dakotas, Mandans, and Algonquins. There were a few locations where a terraced pyramid was used as a home for the chief men and the ruling classes, and were the places of refuge for the people of the village who dwelt in smaller houses scattered on the plains—near the pyramids. Villages of this kind were common among the Mound-Builders of the Gulf States.

These were numerous also on the northwest coast, for here the clans gathered into villages which bore the names of the chiefs, but had totem poles which gave the genealogies of the ancestors of the families and the crest of the divinity who stood at the head of the clan. The villages of the Great Plateau differed from all of these in that they were concentrated into a single building which was erected in terraces and surrounded a court, the apartments being compacted together, so as to make a house resemble a gigantic honey-comb.

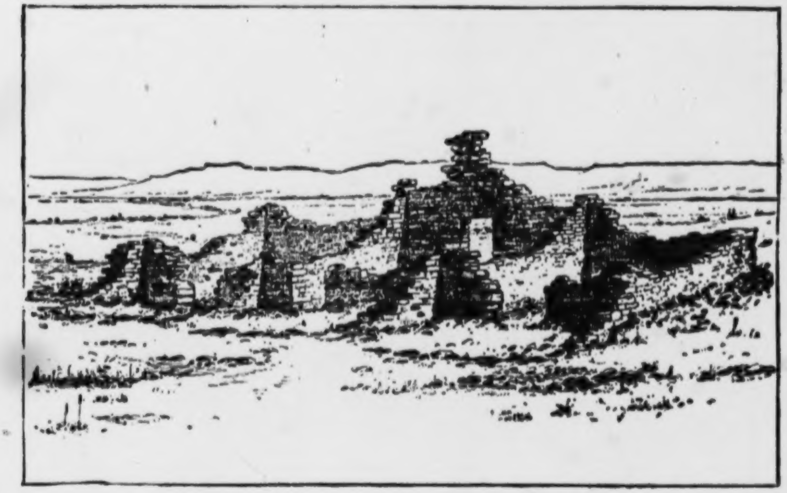
It has been claimed that the great palaces which are built on terraced pyramids in Nicaragua, Guatemala, and Honduras, were communistic houses, and contained whole villages, and were in fact pueblos. But this is doubtful, for society in this region was divided into classes, and the evidence is that the common people dwelt within the enclosures and smaller houses, while the ruling classes occupied the palaces, and the priests resorted to the summit of the pyramids for their sacrifices. We may say, then, that the only place where an entire village was contained in a single house is the one which was occupied by the Pueblo tribes, including with them the Cliff-Dwellers. This makes the study of the Pueblos, or Great Houses, all the more interesting and important, for by it we may learn many things about the domestic life and village organization of the Cliff-Dwellers. It is fortunate that there are so many survivors, and that they are still living in their many-storied houses, that their domestic life and social status and time-honored religious customs have been studied so carefully. There are, to be sure, but few pueblos now standing. Out of the great number which once covered the region with a teeming population, and which made the river valleys and the lofty mesas a scene of life, there can be found only here and there a "great house" which contained the fragments of the various tribes which were gathered into them, and even these pueblos were nearly all built at a modern date ; scarcely one of them is on the same site, or has the same wall and rooms which were seen by the Spaniards; some of the pueblos have changed many times; in fact the only village which remains the same is that one on Acoma. Still we may say that notwithstanding the ruin that has come upon the "Great Houses" all over this pueblo territory, enough of the ancient style of building and ancient customs of the people remain for us to draw a picture of society as it was in pre-Columbian times, and to describe with considerable accuracy the domestic and social life which prevail. We shall take the Great Houses for our study, and endeavor to show what the domestic life was.



A TYPICAL GREAT HOUSE AT ZUNI.

I. The chief peculiarity which may be recognized in the Great Houses is that they were used as fortresses as well as village sites, or pueblos. This peculiarity has been spoken of by the early explorers, and was formerly made prominent. But later explorers have so often ignored the defensive element, and represented even the fortresses of the Cliff-Dwellers as only temporary resorts, that it is important to bring this feature forward again and make it prominent. They were, indeed, fortresses or castles which were permanently occupied, and contained all the population that there was, for it was not possible for families to live separately in such a country. Even if there were no dangers threatening from the incursions of the wild tribes from a distance, or from the attacks of neighboring tribes, it would have been very difficult for them to have gained subsistence from such an arid climate. It was absolutely necessary that the people should gather into great houses and join together in cultivating the soil, as well as protecting themselves from their enemies.

Moreover, there was a sense of loneliness in the midst of this mountain scenery which would naturally drive the people to the villages. While the views are inspiring and full of grandeur, it is the testimony of all who have visited the region that one needs to grcw to it in order to apprehend and realize what magnificent distances there are, and how much sublimity is contained in them. The country differs from most mountain regions, for there is a great lack of vegetation, and there is a strange glare to the sun, and a dreamy haze settles down on the prospect everywhere. We may conclude then that the "great houses" were the products of the country, and the results of environment. Still, they remind us of the great castles of



A TYPICAL SOLITARY HOUSE.

Europe, for they were often situated upon lofty mesas at inaccessible heights, their walls blending with the rocks, making them seem like great fortresses. They also remind us of the walled towns, which according to the scriptures were scattered over the hill country of Judea, and marked the border line of that and the wilderness.

Society was in a far lower state than that which appeared during the historic age, yet the same elements of the clan life and the village estate, which have engaged the attention of so many, were contained in these pueblos, or Great Houses, and they therefore are interesting objects of study.

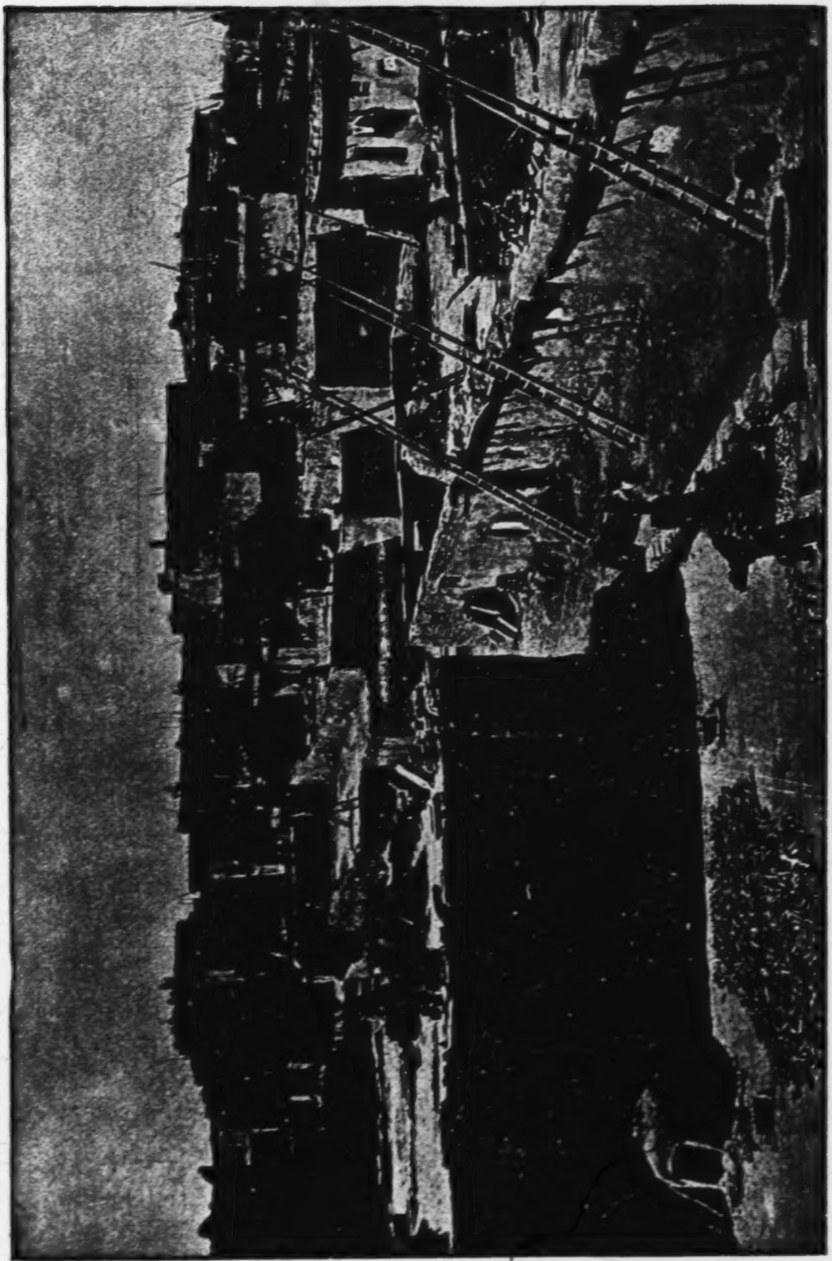
They remind us of the remains of mediæval Europe. There were no lords, nor counts, nor earls, living in castles with their retainers—nor were there any tournaments, or romances such as we read about in Walter Scott's works. There were no horses caparisoned, and no coats of mail.

Still, if there are any buildings in America that can be compared to the ancient castles of Scotland, Ireland, Normandy, and the river Rhine, they are to be found in these so-called great houses. The comparison becomes more striking, however, if we go back farther in history and take the state of society which prevailed when Joshua, the great leader, took possession of the Holy Land. The people dwelt in "walled towns," yet they were organized into clans and tribes which were separate, and Joshua with his more thoroughly organized army was able to overcome the people.

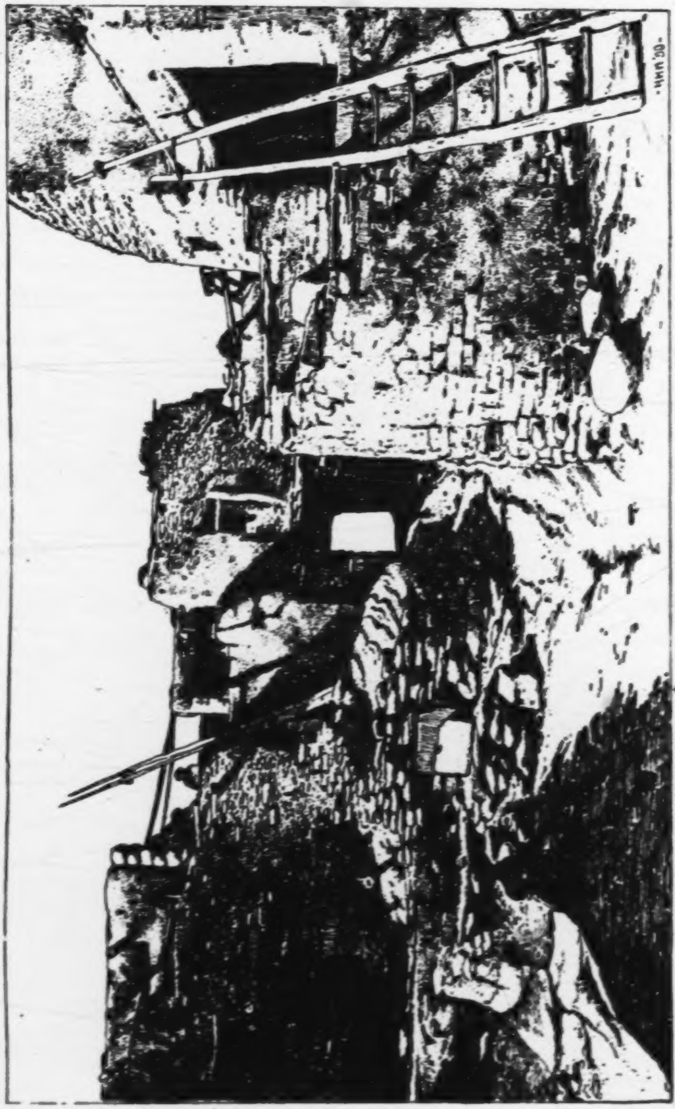
There is another line of comparison. Many nations and tribes have been driven from their homes in the valleys, and have been compelled to resort to the hilltops, and mountains, and have there erected citadels and forts for defense. Such seems to have been the case all over the plateau, even in the region that extended into the southwest as far as Chihuahua in Mexico; for here there were fortresses which were separated from the other houses and which had resemblances to the castles or citadels of the East.

II. We shall take up the description of these villages with their Great Houses, or Casas Grandes, before we proceed with that of the Pueblos, or Great Houses proper. These make a class of villages and fortresses quite unlike the Great Houses concerning which we are speaking.

The description of these has been given by various writers, and we shall quote from them in order to show the difference between the two classes of structures. These have gone by the name of Casas Grandes, which signifies Great Houses, but they were more properly straggling villages, with a Great House, or castle, in the midst, or one side of the village. The houses of which the village was composed were often scattered along side of a stream or irrigating canal. We will begin with the ruins which the Spanish came upon in Sonora, but would say that these resembled the ruined villages which were



MODERN PUEBLO WITH COVERED PASSAGE-WAY.



MODERN PUEBLO, SHOWING WALLS, TERRACES, AND DOORS.

situated upon the Gila, and in some respects those in the valley of the Tempe in Arizona. The characteristics of these ruined villages were as follows:

1. They were made up of a series of mounds, or ruins, which marked the sites of houses, which instead of being close together and compact, as were the pueblos, were scattered over a wide area.

2. The villages were sometimes surrounded by a wall, and so they might well be called "wall towns." In Sonora the villages were upon the high lands, but in Arizona they were situated on the low lands. In Sonora the houses were built of adobe as the material was convenient. In Arizona they were built of adobe and sometimes of wattle work, but the houses were separate. No such structure as the honey-comb, communistic houses called pueblos are to be found in this region.

3. There was always in the center or at one side of the village, an imposing group of ruins, to which the name of Casa Grande was given. This group was supposed to be the castle or fortress, and was evidently designed as a place of retreat in case the village was attacked.

4. There was a marked difference in the architecture and the art of the two regions, showing that the people in this southwest province had reached a stage of advancement several grades higher than that which was known to either the Cliff-Dwellers or the Pueblos.

5. The citadels, or Great Houses, called Casas Grandes, were actually castles, and marked that stage where a fortress was entirely separate from the abodes or ordinary houses, indicating that a military class as well as a religious class had risen even when the clan life had remained the same.

6. There was near these ruined houses and castles, or citadels, a certain amount of cultivatable land which was irrigated by the arroyas, or canals, showing that they were agricultural people who dwelt in the villages.

7. The Great Houses were not always in the centre of the village, nor were they always on the low land, for there was a variety in their location. Still, so far as they have become known the villages are all characterized by the presence of some such imposing structure. In this we see the difference between the two classes, a difference which nearly all writers upon the subject have spoken of. Mr. Bandelier has spoken of the difference between the two classes of structures in the following language:

> Although the communal Pueblo houses of the North seem to be different from the structures on the Gila and at Casas Grandes, they still show the same leading characteristics of being intended for abodes, and at the same time for defense. In the northern villages, generally, both features are intimately connected, whereas further south the military purpose is represented by a separate edifice, the central house or stronghold, of which Casa Grande is a good specimen. In this, the ancient village of the Southwest approaches the ancient settlement of Yucatan and of Central America, which consisted of at least three different kinds of edifices, each

distinct from the others in the purpose to which it was destined. It seems, therefore, that between the thirty-fourth and the twenty-fourth parallels of latitude the aboriginal architecture of the Southwest had begun to change in a manner that brought some of the elements that were of northern origin into disuse, and substituted others derived from southern influences; in other words that there was a gradual transformation going on in ancient aboriginal architecture in the direction from north to south. At Casas Grandes a marked advance over any portion of the southwest was shown, particularly in certain household utensils, in the possible existence of stairways in the interior of houses, and in the method of construction of irrigating ditches. Nevertheless the strides made were not important enough to raise the people to the level of more southern tribes. Their plastic art as far as displayed in the few idols and fetiches remains behind that of the Nahuas, or Mayas. They seemed to have reached an intermediate stage between them and the Pueblos, though nearer to the latter than the former. Large halls are not found in the ruins of the north. They appear to be almost the rule at Mitla and in Yucatan, and they are met with on the Gila under a climate which is semi-tropical. The usual supposition is that Casas Grandes was the "capital" of a certain range or district, and that the small ruins were those of minor villages. It is my impression that several tribes, probably one of the same stock occupied the country in separate and autonomous groups, and that Casas Grandes is probably the past refuge of one of these tribes. The site is well selected and commanding an extensive view. The cultivatable land commences at the foot of the terrace which is only a few feet above it. No enemy could approach Casas Grandes in the daytime without being discovered. The question of the form of these edifices, whether they were like the pueblos of the north, with retreating terraces, or with straight walls to the top, and a central tower like that of Casa Grande on the Gila, is a difficult one to determine. The conical shape of the mounds would lead to the inference that the central parts were higher than the outer ones; on the other hand, there are outer walls still standing which are three stories in height.

As to the height, Mr. Bandelier says:

> Besides being quite extensive for southwestern ruins, they are also compact, so that the population, if we take into consideration the fact that the buildings were several stories high, may have amounted to more than three or four thousand souls. In that case it would have been by far the largest Indian pueblo in the southwest—and twice as large as the most populous village known to have existed farther north.
>
> From a close examination of what remains of the building, or buildings, I came to the conclusion that the outer portions were the lowest, and not above one story in height, while the central ones were from three to six stories. Hence the large heaps of ruined walls and rubbish in the centre, and in consequence the better preservation and support of that portion of the edifice. By far the larger portions which have fallen are the exterior walls. This arises from the moisture of the earth and the greater exposure to rains. The central parts are in a measure protected by the accumulation of rubbish, ad by the greater thickness of their walls.

In reference to the resemblance of the ruins to fortresses, Mr. Bandelier says:

> Comparing the architecture of Casas Grandes with that of the Gila, it strikes me that the settlement was more compactly built, and that the edifices present a higher degree of skill, if not in the manner in which they are constructed, at least that in which they are arranged. These were manifestly not for habitation alone, but also with a view of defense. There are, as far as I could see, no fortifications proper, but the size and situation of the buildings, their number, and the strength of the walls, were a means of protection against an Indian foe. The buildings were really fortresses as well as houses. Where a cluster is as large as Casas Grandes it is probable that the downfall was gradual, and probably brought about by various causes.

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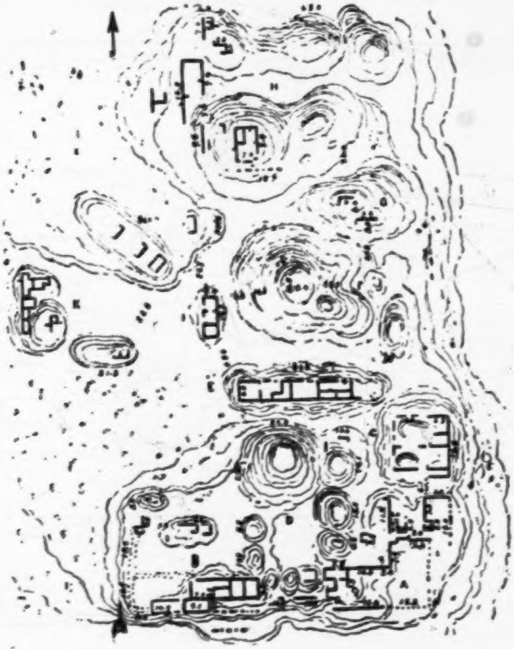
Papers iv, of the Archæological Institute of America (American series) p. 552.

Mr. Cushing has recognized the same distinction between the northern and southern tribes by means of their traditions as well as their architecture and art. He says there are traditions which show that a people from the north mingled with the people of the south and introduced two forms of culture and two sets of legends and myths. According to these traditions one branch of their ancestral people had at some remote time descended from the north and had there become the aborigines, while another branch was intrusive from the west, or southwest, but had formerly occupied the country in the lower Colorado. This evidence was also confirmed by the customs of the people.



PLAT OF RUINS OF CASAS GRANDES.

Mr. Bancroft describes the location of Casas Grandes in Sonora as follows:

> These ruins are situated on the Casas Grandes River—which flowing northward empties into a lake near the United States boundary one hundred and fifty miles northwest of Chihuahua. They are frequently mentioned by the early writers as a probable station of the migrating Aztecs,

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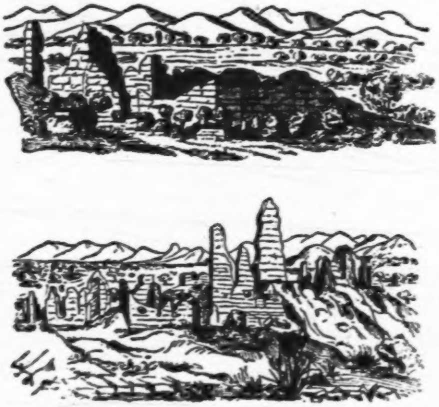
See Bancroft's "Native Races," vol. 4, p. 606.

The cuts on this and the opposite pages represent views of the ruins from the different standpoints, as sketched by Mr. Bartlett.

but these early accounts are more than usually inaccurate in this case.

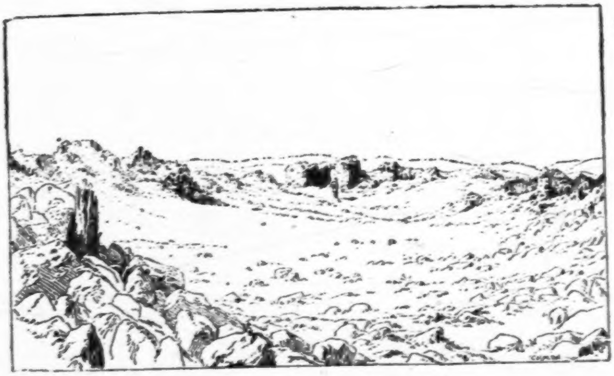
The ruined casas are about half a mile from the modern Mexican town of the same name, located in a finely chosen site, commanding a broad view over the fertile valley of the Casas Grandes or San Miguel river, which valley—or at least the river bottom—is here two miles wide. This bottom is bounded by a plateau about twenty five feet higher, and the ruins are found partly on the bottom and partly on the more sterile plateau above. They consist of walls generally fallen and crumbled into heaps of rubbish, but at some points, as at the corners and where supported by partition walls, still standing to a height of from five to thirty feet above the heaps of débris, and some of them as high as fifty feet, if reckoned from the level of the ground.



RUINS OF CASAS GRANDES.

These villages extend over a large area, and the central building, or castle, commands an extensive outlook; that of Casas Grande, of Arizona, covers about sixty-five acres, and the view gained from the Casas Grande is for miles in every direction. Bandelier says: "In the whole southwest where there are thousands of ruins, many of which represent villages located with reference to outlook, there are few if any so well situated as this. There are irrigating ditches near all these villages." Bandelier says of the ditch near the Casas Grandes in Sonora: "The main irrigating ditch enters the ancient village from the northwest, and can be traced for a distance of two or three miles. It takes its origin near a copious spring, and looks as if it had conducted the waters of the spring to the settlement for household purposes only. It empties into a circular tank 49 feet in diameter and 5 feet deep, and seems to have also passed through this, and supplied a larger tank 72 feet in diameter and 7 feet deep. Another acequia 14 feet wide looks more like a road-bed than a ditch, but it is slightly raised above the ground and shows four longitudinal rows of stones laid at intervals from 4 to 6 feet apart. There are ruins and mounds scattered in small clusters near the various rivers which suggest the former existence of a number of settlements, composed of large many-storied houses, similar to those of Casas Grandes. There are dams, and dykes; and between the dykes plots of tillable land, artificial garden beds. The plains are covered with grass, on which antelopes were grazing in herds."

We here have a picture of village life which differs entirely from that of the Pueblos of the plateau, and still more from that of the Cliff Dwellers of San Juan; thus making three classes of settlements, in two of which there are what are called "Great Houses," though these serve very different purposes. On the plateau they contain the whole village and so are called Pueblos. Farther south they are isolated and form only a part of a village, and serve as a fortress, or outlook and final place of retreat.



FORTIFIED PUEBLO WITH OUTER WALL AND INTERIOR COURT.

III. The defensive elements which were embodied in these Great Houses are to be considered here. They consisted of the following features:

1. The Great House was erected in such a manner that it became the abode of a number of clans which were governed by a chief with his subordinates, and a fortress which was defended by the people who were gathered en masse, and so constituted a fortified village, as well as a Great House.

2. The arrangement of the terraces and the apartments was such that a dead wall was always presented to the face of an approaching foe, and must be scaled in the presence of the inhabitants of the entire village, who might easily gather on the first terrace for the defense of their homes. Thus a Great House was a fortress which was constantly occupied. Every part of it was arranged for the security of the people.

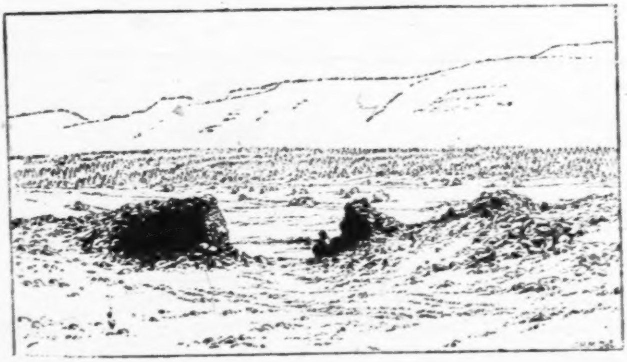
3. There were ladders which furnished access to the first terrace, and were easily ascended by men, women, and children, and were drawn up by night, and so the house was secured from prowling foes.

4. The stores or provisions for the sustenance of the people were placed below the first terrace, in rooms which were

dark and difficult of access, as they were reached by trap doors and rope ladders, which led into the domestic apartments ; but the people would need to be driven away before the provisions could be reached.

5. Nearly all the Pueblos had a reservoir of water in the court. This was sometimes fed by a spring and small springs which flowed through the village. It was drained, also, so that the water could pass through the gateways to other reservoirs below, and used to irrigate the fields near by. This enabled the people to undergo a siege of considerable length.

6. The Cacique or Governor lived in the upper story, and the houses were high enough so that a view could be gained of the surrounding country. This was the method of defense of the Mound-Builders of the south, but it was more effective among the Pueblos.



FORTIFIED PUEBLO WITH DRAINED COURT AND RESERVOIR OUTSIDE.

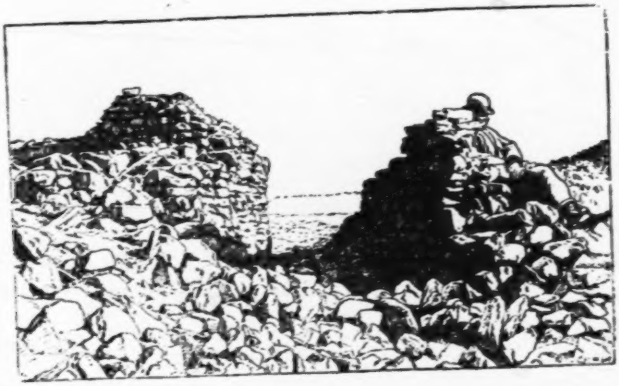
7. There was always a look-out near by in the shape of a tower where sentinels were placed. These look-outs commanded a view of the surrounding country for many miles, as they were either on the mesas or at points in the valleys where the view would be extensive up and down the canon.

8. The pueblos were generally built in groups at varying distances from one another, but always near enough so that signals could be exchanged. The people living at the various villages would come to the defense of the one that was attacked. There were no confederacies, and no general leader for the entire tribe, as each pueblo was like a feudal castle ; yet the tribal bonds were sufficient to hold them together.

9. The government was also defensive, but there was a religious class which held the people closely to the customs which were inherited from their fathers, and thus always had a separate house for their ceremonies. In this respect the

Pueblos differed from the villages southwest. There were no estufas in any of the Casas Grandes, or Great Houses on the Gila, but in their place there was a central house which was used both as a citadel and a temple. In the pueblos the estufas were very prominent, but they were generally beneath the surface and were used merely as sacred chambers, or houses for religious ceremony. Still it is more than likely that even the estufas furnished defense for the Pueblos, inasmuch as they were the places where the men and boys were constantly assembled and from which the real defenders would emerge in the time of danger, their situation in front of the terraces being such that no attack could be made without attracting the attention of the inmates.

10. In nearly all the pueblos there were gateways, some of which were marked by solid abutments of stone, others were mere passage ways through the walls over which the apartments of the upper stories were built. These were in reality covered ways. They are more common in the modern pueblos than in the ancient. Illustrations of the ruins at Pecos with the courts and reservoirs and gateways and ancient walls are given in the cuts.



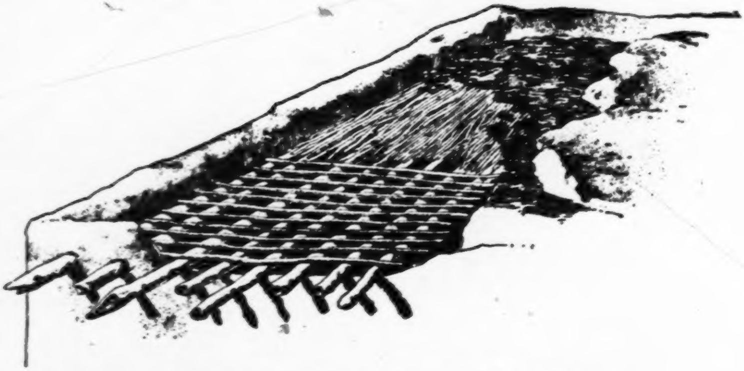
GATEWAY TO THE COURT AT PECOS.

Now such were the defensive elements which were embodied in the Pueblos and which attracted the attention of the discoverers and early explorers. There are many illustrations which might be given, but we shall only refer to the descriptions which have been given of the Pueblos on the Rio Grande and the Zuni by the different explorers. The following is Mr. Morgan's description:

They show the principle features: First, the terraced form of architecture, common also in Mexico, with the housetops as the social gathering places of the inmates; and second, a ground story for safety. Every house, therefore, is a fortress. The first story is closed up solid for defensive reasons, with the exception of small window openings. The defensive element so prominent in this architecture was not so much to protect the village Indians from each other as from attacks of migratory bands coming down from the north. The pueblos now in ruins, and for some distance north testify to the perpetual struggle of the former to maintain their ground as well as proves the insecurity of their condition.

With respect to the manner of constructing these houses, it was probably done from time to time and from generation to generation. Like a feudal castle, each house was a growth by additions from small beginnings as exigencies required.

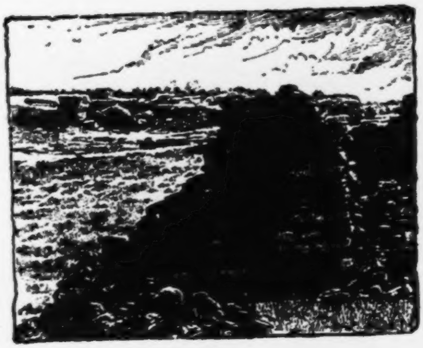
Mr. Morgan describes a cluster of ruined pueblos on the Animas river, one of which was five or six stories high; "It consisted of a main building, two wings, and a fourth structure crossing from one wing to another, enclosing an open court. The mass of material used in the construction of the edifice was very great. The walls were surprising. They varied from two feet four inches to three feet six inches in thickness. Every room in the main building was faced with stone on the four sides, with an adobe floor and a wooden ceiling. The house was a fortress and a joint tenement house of the average American model. These pueblos, newly constructed, and in their best condition, must have presented a commanding appearance, from the material used in their construction, from their palatial size and unique design, and from the cultivated gardens by which they were doubtless surrounded, all of which were calculated to impress the beholder with the degree of culture to which the people had attained."



MANNER OF CONSTRUCTING PUEBLO ROOFS.

Mr. Morgan speaks also of nine pueblos within a compass of a mile square, and a round tower, which was the most singular feature in the structure. It differs from the ordinary estufa in having three concentric walls—the inner chamber about twenty feet in diameter, the spaces between the encircling walls about six feet, the thickness of the wall about two feet and six inches. This tower stands entirely isolated.

IV. We see, then, that the defensive character of the "Great Houses" was very prominent, and that the name They were, to be sure, not ordinary houses, such as people live in nowadays, unless we take the apartment houses or flats Fortress is appropriate for them. There was, however, a domestic life which embodied itself in them, and which makes the term houses, or "Great Houses," even more appropriate. which are so common in the cities, as our model. The following are the elements of domestic life which became embodied in them:



RUINED PUEBLO ON THE CHACO.

1. There were apartments for the families; each family having a suite of rooms which was arranged vertically, the storerooms below on the first story, which was closed, and the living apartment in the second and third story, the apartments of the chiefs on the highest stories.

2. There were estufas, or kivas in connection with every pueblo or "Great House." These varied in size and position. but were generally in the court and in front of the terraces, They were places where the secret societies assembled, where the youth were initiated and the children were educated, and religious ceremonies were conducted.

3. The houses were built around three sides of a square and had a double wall across the other side. The area thus enclosed was used for religious ceremonies, processions, and for playgrounds. Where the "Great House" was built on the level ground the court was in front of the building, but in some there were two or three courts.

4. There were walls and windows, ceilings and floors, lintels and door-sills in these houses, exactly as in modern houses.

5. The walls were ornamented and whitewashed, and presented an attractive appearance. The outside walls were also built with varied colored stones, and were symmetrical and showed much taste. The angles where the great buildings joined were sometimes bungling, for there were no connecting joints. One wall was set up against another. There were no columns and

no arches, no piers nor lintels, and even the sills were rude, unhewn stone.

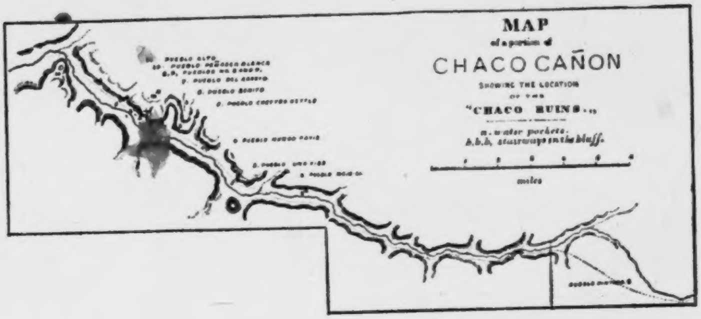
These peculiarities indicate the social state of the people. They show that they were in the middle status of barbarism, or about half way between the Mound-Builders of the Mississippi Valley and the partially civilized tribes of Mexico and Central America. The fact that they could build such massive stuctures which could be occupied by such a great number of families, prove that they were much in advance of the ordinary Indian. They certainly present forms of architecture and styles of art which no ordinary Indian has ever reached. There has been a tendency to minimize their skill and bring down their social status to the level of the hunting tribes, but the contrast between these and the round huts of the Pimas and the conical huts of the Apaches is enough to refute all this. The testimony of the early explorers is in this respect more reliable than some of the later, for they realized the difference between the Indians and the Pueblos. There is certainly a difference between an Indian village and a Cliff-Dweller's village. There is also a marked difference between a Cliff-Dweller's village and the ordinary Pueblos. There is also a difference between these Pueblos and the straggling villages which have beeen found on the Gila and from there to Chihuahua. These, taken together constitute four or five grades of architecture, and indicate four or five types of life, each one of which was undoubtedly closely conformed to the environment. This is the testimony of nearly all the early explorers, and has been confirmed by the particular study of the structures in these several localities, and especially those which are now in ruins.

We notice further that there is a great difference between an Indian wigwam and a Cliff Dweller's house. There is also a difference between a Cliff-Dweller's house and a Pueblo. There is also a difference between the Pueblos on the plateau and the Great Houses on the Gila, though the people may have all followed an agricultural life, and may be classed with agriculturists rather than with the hunters. If we were to draw the comparison between the prehistoric agriculturists and the modern agriculturists, we should say that those who dwelt in the pueblos give full as much evidence of a comfortable, peaceful, and contented domestic life, and can by no means be classed with savages, or ordinary blanket Indians. This is true especially of the Cliff-Dwellers as well as the Pueblos, for the early explorers have recognized the superiority of the architecture and art of this unknown people, and give their testimony in reference to it, while some of the later explorers seem to bring everything which this mysterious people have left, down to the level of the rudest class of the aborigines. We do well to take this testimony and make our ideas of the domestic state of the Cliff-Dweller and Pueblo as correct as possible.

The best illustration of the peculiarities of the Pueblos or "Great Houses" which have have been spoken of, as well as the differences which exist between them and the other structures, will be found in the ruined pueblos which are situated in the Chaco canon, and which have been often visited and described. We shall therefore give considerable space to these.

Mr. Morgan says:

> The finest structures of the village Indians of New Mexico and northward of its present boundary are found on the San Juan and its tributaries, "unoccupied and in ruins." The supposition is reasonable that the village Indians north of Mexico had attained their highest culture and development where these stone structures were found. They are similar to the style and plan of the present occupied pueblos, but as superior in construction as stone is superior to adobe, or cobble-stone and adobe mortar. They are also equal if not superior in size and in the extent of their accommodation. They are all constructed of the same material and on the same general plan, but they differ in ground dimensions, in the number of rows of apartments, and in the number of stories. They contain from one hundred to six hundred apartments each, and would accommodate from five hundred to four thousand persons.



The impression formed is that these ancient ruined pueblos were both fortresses and agricultural settlements, as they were situated in the midst of a rich valley, but were built up like fortresses. The valley differs from the great cañons in the lowness of the bordering walls. The cañon is about five hundred yards wide, and is perfectly level from one side to the other. There are no traces of irrigating ditches, yet it is evident that agriculture was practiced by the people who dwelt in the pueblos. This is proven by the fact that so many pueblos are crowded together, some eleven or twelve within the space of fifteen miles, each pueblo having been the abode of several hundred people. We may say that scarcely any settlement in modern days has so abounded with a teeming population, and very few have presented more evidences of comfort as well as of culture. If we compare them with the frontier cabins and hamlets we should say that the pueblos were not only the more densely populated, but they were better furnished with the conveniences of domestic life, and the struggle for existence was less intense. The artistic skill which is shown by the specimens of art is quite equal to that which is found among the whites who have made their homes in the same region.

General Simpson first discovered these pueblos in 1849, and furnished an excellent description of them. He, however, found only seven "Great Houses." Mr. Jackson visited them in 1876, and identified eleven sites and made a plat of them all. Mr. F. T. Bickford in 1890 visited them and found them in ruins. He took photographs of them which exhibit their peculiarities. The map given by Lieut. Simpson will show their location and the relative distances between them. The table given herewith will show the size of each and the number of estufas and the number of stories, as well as the distances from one another. The plans which are given in the plates will show the shapes of the pueblos. The cuts which are taken from Mr. Bickford's engravings, will show their present condition. The quotations from Mr. Jackson's account will give their general characteristics. Speaking of the Pintado, he says:

> It was not terraced symetrically, but irregularly after the manner of the present pueblos. The ground floor was divided into smaller apartments than the second floor, the rooms in the lower story being divided into two or three. The second story was ten feet between the joists, and the third seven feet. Every room had one or two openings in the form of window-like doorways, the largest of which are twenty-four by forty inches, leading into living rooms. The sills of these doors are generally about two feet above the floor. In the west wall are several large windows looking outward from the second story, and in the north wall very small ones only in the second and third stories. There were a few very small apertures in the first story, mere peep-holes. The walls of the first floor are 28 to 30 inches thick, those of each ascending story being a little less. The masonry, as it is displayed in the construction of the walls, is the most wonderf feature in these ancient habitations, and is in striking contrast to the car less and rude methods shown in the dwellings of the present Pueblos. Great pains were taken in the construction of the doorways, the stones being more regular in size and the corners dressed down to perfect right angles; the same care was given to the openings in the lowest floor as to those in the upper. In the northwest corner of the main building, back of the estufas, and on the second floor, a doorway has been constructed and leading diagonally from one room to another, which displays particularly nice workmanship. The lintels were in nearly every case composed of small round sticks of cedar or pine, placed in contact, but in the smaller openings formed by a single slab of stone. Although there is a great diversity in the size of the stones employed, still they are arranged in horizontal layers, rows of the larger stones alternating with rows of smaller ones, presenting at a little distance a beautifully laminated appearance.
>
> Twelve miles from the Pueblo Pintado are the next important ruins, those of the Pueblo Wejigi. The walls are still standing of considerable height and indicate at least three stories. Two miles and a half farther down are the ruins of Una Vida. Here there is a break about a half mile in the bluff in the center of which stands a remarkable butte some three hundred feet in height. In the gaps we have five distinct views of the

Sierra San Mateo (Mount Taylor). The Canyon is about 500 yards wide and is perfectly level from one side to the other. The pueblo has an L shaped main building, with a semicircular wall. In the enclosure remains of the largest estufa are to be found.

One mile further on are the ruins of Hungo Pavie in quite perfect condition. It is built around three sides of a court which is enclosed by a semi-circular wall. The single estufa is situated midway in the north building, and extended up to the top of the second story. The interior has six counter-forts or square pillars of masonry like those of the pueblo Pintado built into the encircling wall at equal distances from each other.

Two miles further along are the ruins of the Chetro Kettle, whose dimensions are 440 by 250 feet. There are seven estufas, four of which are built together in a solid body, and project from the main building. One of these is noticeable for its height, rising as it does above the general level of the ruin. It was originally divided into three stories all above ground. The remnants of the abutments, between the first and second floors still remain in the wall. In this pueblo was the room described by Simpson, which is 14 x 17½ in size, and 10 feet in elevation. In this ruin there was at one time a wall running around three sides of the building 935 feet in length, 40 feet in height, giving 37,400 square feet of surface. Millions of pieces of stone had to be quarried and dressed and fitted to their places. Massive timbers had to be brought from a distance and fitted to their places and then covered. The other details of window and door making, plastering, and constructing of ladders, must have employed a large body of intelligent, well-organized, skilful, patient and industrious people, under thorough discipline for a very long time.

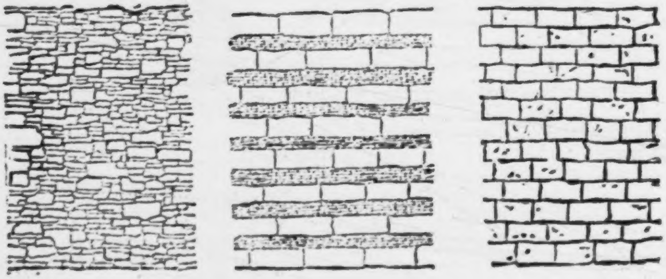
Five hundred yards below and close under the perpendicular walls of the canon are the ruins of the Pueblo Bonito, the largest and most remarkable of all, Its length is 544 feet and its width 314 feet. A marked feature is the difference in the manner of construction. It was not built with unity of purpose, but large additions have been spliced in from time to time, producing a complexity in the arrangement of the rooms. Several of the interior, parallel and transverse walls are standing full thirty feet high. Three kinds of masonry appear at various places throughout the building, showing that it was built at different periods. The estufas form an important feature, both from the number, size, and from the manner in which they were built. There were twenty-one of them in all.

Three hundred yards further are the ruins of Pueblo Arroyo, so named because it is on the verge of a deep arroyo that traverses the middle of the canon. The walls of the first story are very heavy and massive, still standing to the height of the third story. The arroyo is 16 feet deep, but there is an older channel cutting in near the large ruin of about one-half the depth in which are exposed some old lines of masonry. Since the desertion of this region the old bed has been filled to the depth of at least 14 feet.

Two miles further down are the ruins of the Pueblo Penasca Blanca. which next to the Pueblo Bonito, is the largest in exterior dimensions of all the ruins. The dimensions of the court are 346 x 269 feet; the outer building 400 x 363 feet, four stories in height. There are seven estufas. The rooms average 20 feet in length.

Two hundred and fifty yards below Pueblo Del Arroyo was a stairway hewn into the hard sandstone, each step 30 inches long and 6 inches deep, with hand-holes in the rock in the steepest part of the ascent. On the summit of the bluffs, half a mile over the plateau, are the ruins of the Pueblo Alto. They are situated so as to command the entire horizon. Away to the north stretches the great basin of the Rio San Juan, the summits of the La Plata mountains glimmering faintly in the distance. The Sierre Tunicha stretches across the entire western covered summits of the Sierra San Mateo. In the east the summits of the Jemez mountains are as view, the frosted crown of Pelado shining above them all. This ruin in htus nearly midway and above all the others—dominating them so far as position is concerned.

V. The comparison of the Cliff-Dwellers with the Pueblos will be interesting in this connection. We have shown that the cliff-dwellings were fortresses as well as houses, and were permanently occupied and so had the same character as the "Great Houses" which were situated on the mesas and in the valleys, and were called Pueblos. This has been disputed by Mr. Mindeliff, who has explored the cliff-dwellings in the Rio de Chelly, as well as the pueblos on the Zuni and elsewhere. His theory seems to be that the cliff-dwellings were temporary resorts, and only to be compared to the Tusayan "Kisis," brush shelters, and the "watch towers" of the Zunis—in other words they were horticultural outlooks, occupied only during the "farming season."†



SPECIMENS OF MASONRY ON CHACO CANYON.*

In speaking of the ruins in Canyon de Chelley he says :

> Here, if anywhere, we should find corroboration of the old idea that the cliff ruins were the homes and last refuge of a race harrassed by powerful enemies and finally driven to the construction of dwellings in inaccessible cliffs, where a last ineffectual stand was made against their foes ; or the more recent theory that they represent an early stage in the development of pueblo architecture, when the pueblo builders were few in number and surrounded by numerous enemies. Neither of these theories are in accord with the facts of observation.

This view is, however, entirely erroneous for the cliff-dwellings on the Canyon de Chelly and on the Mancos Canyon were plainly permanent dwellings, and may well be called pueblos, for they had all the elements contained in the pueblos, and constituted villages which were placed in the sides of the cliffs for the sake of defense. In other words they were "Great Houses," and resembled those which we have been describing with the single exception that they were built on the ledges instead of on the mesas or in the valleys, and were better fortified than other pueblos or Great Houses.

As a proof of this we would refer to the names which have been given to them. It may be noticed that every one has been called a house—viz.: Long House, Balcony House, White House or Casa Blanca, and Montezuma House. One has been called the Cliff Palace, another has been called Montezuma Castle; but not a single one has received the name of "outlook," or "summer-house," or "farming shelter," or "refuge," which would indicate that no one else had formed this idea of the cliff villages. Furthermore, if we take specimens found in the Cliff Canyon, the Acowitz Canyon, Montezuma Canyon, Mancos Canyon, or any of those found on the Rio de Chelly, such as Monumental Canyon, Canyon del Muerto, we shall find that they are as worthy to be called "Great Houses" as any of those situated upon the mesas south and east, and far more worthy than those which are found in the valleys to the southwest. This is an important point for it helps us to distinguish between the two great classes which are found in this entire region, and which were evidently built by two different races or stocks of pre-historic people. It helps us also to decide about the history of the Cliff-Dwellers and to realize how their history was connected with that of the Pueblos, an s disconnected from the ruins in the southwest.

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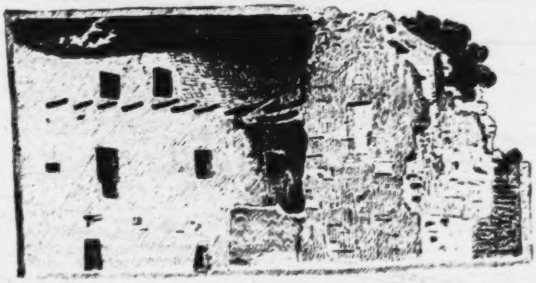
*Rep. Ethn. B. p. 92. †For description of walls, see page 338.



BALCONIES AND DOORS.*

We shall point out the resemblances and dwell upon the particular features somewhat in detail, for the reason that these are important for the solution of the problems. They are as follows:

1. The cliff-dwellings were built of stone, the very material from which the large majority of the pueblos or "Great Houses" were built. There were, indeed, a few "Great Houses," or pueblos constructed from adobe. These, however, are far to the south in a region where it was more convenient to build of this

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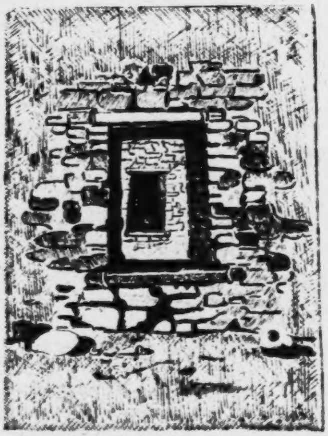
*This cut shows the balconies and the doors and the walls of the cliff-house in Navajo Canyon, which was first described by Mr. F. H. Chapin. The following cut shows the doors and the walls in a cliff-house which was discovered by Mr. W. K. Moorhead and Mr. L. W. Gunckel. This doorway resembles those which are common in modern houses, except that there is no stone lintel, but in its place are several wooden rods which are held together by wythes, the ends projecting over the walls which constitute the sillsof the door. The resemblance is more one of appearance than of construction. Both of these styles doo appear in the pueblos.

material. The adobe was the stuff from which the walls of Casa Grande were erected, and constituted also the substance which was used in the scattered houses, which are now buried underneath the mounds of the southwest. There were a few houses built up of wattle work, the posts having been supported by boulders which form the foundations of the houses. These constitute an entirely different class. Their location is marked by what are called the boulder sites, which are very numerous in the valley of the Verde. A few houses were built of lava blocks. These have been called solitary houses.


DOORWAYS OF A CLIFF DWELLING.

2. They were built two or three stories high and were always closely connected and resembled the pueblos which follow the honeycomb pattern. They differ in this respect from the villages in the southwest and from those in the valley of the Verde. The first are generally isolated houses; the last are not only isolated but are inferior in their method of construction, having been built of boulders, and were only one story high. This is an important distinction, for he "Great Houses" were always more than one story in height.. The ruins of the cliff-dwellings are scattered over the sides of the cliffs and are on different levels, but they were evidently when constructed more than one story high. The number of stories in the cliff dwellings varied according to locality, but were generally equal to those of the pueblos. In the Cliff Palace the buildings were five stories high. The upper stories were on the ledge and the lower stories below. The two lower stories had been built outside the limits of the arch, and lower than the platform of the cave. In the White House (Casa Blanca), in the Rio de Chelley, there was a pueblo several stories high below the ledge and a cliff dwelling on the ledge. It is supposed that they were connected.

3. As to the courts we may say of the cliff-dwellings when defense was the chief thing these were back of the house, between the houses and the cliff. Access to them was prevented by the row of houses, towers and walls which formed a line close to the ledge. But the kivas were placed outside of the row of houses on the sides of the cliffs. Courts were as common among the Cliff Dwellers as among the Pueblos, but more

irregular in shape, as they followed the lines of the cliff. The courts were used for play-houses, sometimes for weaving, and a part of them for cooking, and resembled the terraces of the "Great Houses." The stores were frequently placed in niches back of the courts. Storage rooms were placed in the sides of the cliffs above the houses, as can be seen in the case of the High Houses on the Mancos (Fig. 3 and 4). These were sometimes placed in niches, or cubby holes in the rock, a few feet above the river valley, which were used for caches or storehouses and were reached by either rope ladders or by climbing up the precipice through the aid of hand-holes. Mr. Cushing says the stores were placed in such out-of-the-way caches in order[*] to keep them from the depredations of the smaller animals which frequented the region, as well as to protect them from the hands of men.

4. The terraces are prominent in all the cliff-dwellings. They were generally turned in toward the cave, or the rock. The houses presented a dead wall to the outside of the cave. In this respect they were just the reverse of the pueblos, or "Great Houses," for in them the court was inside of the house and the walls were either made to curve, or to bend around the three sides of the court, the round towers having their walls made in a complete circuit, the court inclosed by the crescents, which were concave toward the court. In the cliff-dwellings the horns of the crescent were generally turned out and the largest houses were in the concave. The courts were between these and the rocks, the walls and the rocks making a double crescent.

5. The balconies are common in the cliff dwellings and the ancient pueblos. One house is called "Balcony House" on account of the balconies found in it. The Spaniards found balconies in the pueblos at Zuni and Acoma and elsewhere. They took refuge under one during a snow storm. Castenada speaks of this.

6. Roofs, floors and timber work are essentially the same in the clliff dwelling as in the pueblos. Lieutenant Simpson has described the floors in the ruined pueblos on the Chaco. The cut given with this will show how the floors were made. Mr. Mendeliff says, so far as regards the use of timber as an element of construction of the cliff dwellings, the specimens of de Chelly are rude and primitive as compared with the works found in other regions.

7. The doorways [†] in the cliff dwellings are very interesting. These contain a history in themselves and give hints as to the development of architecture in this far-away region, and its

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[*] Mr. Chapin says the Cliff-Dwellers used hampers in which they carried burdens, and straps to put through their handles, ollas, or water jars.

[†] An illustration of the doorway in a Cliff-Dweller's house is given in the cut. It is to be seen that there no piers and no lintels, and that the sides are made of rude masonry, and yet the attractivess of the doorway consists in its simplicity.

ddaptation to the surroundings. The typical Cliff-Dweller' oor was made narrow at the bottom and wide at the top, with a square jog half way up. This was for the convenience of those who carried burdens from the valleys below up the cliffs, on their backs, and who could not lay them down before they had reached the inside of the houses. The doors are suggestive of a life which was peculiar to the Cliff-Dwellers. The people were compelled to carry corn from the valleys up to the houses hidden among the cliffs. Even the water was carried in pottery vessels which were placed in a net, which was supported about the head by a band, the net being hung over the back. This would require strength and courage. The women were the water carriers and the doorways were for their convenience.

8. The walls* of the cliff-dwellings resembled those in the "Great Houses." They varied in their finish. Sometimes there were two or three kinds of walls in the same buildings, showing different periods of occupation. Generally the walls of the cliff-dwellings were superior to those of the pueblos. This is the universal testimony of all the explorers. The opinion has been expressed that there was a great decline after the Cliff-Dwellers left their original habitat. There are many specimens of highly finished masonry in the walls; these especially are found in the towers, for in them the stones are cut or broken so as to conform to the circle. The walls were sometimes decorated so as to present a very tasty appearance. A specimen of this ornamentation is seen in the "Cliff Palace" which is represented in the cut. The description of this has been given by Mr. F. H. Chapin, who says "a broad band has been painted across the wall, and above it a peculiar decoration," which is shown in one of the illustrations. The same kind of decoration was found by Mr. Mendeliff in an estufa in Canyon de Chelley. No such decoration has been found in the modern pueblos.

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* The similarity of the Cliff-Dwellings to the Pueblos may be seen by examining the cuts and comparing the two classes of structures, especially the cuts which show the many storied houses of Cliff Palace and of the Pueblos on the Chaco; also those which show the masonry of the ruined walls on the Chaco and those on the Animas. Also those showing the terraces of the Pueblos of the Tusayans, and those of the Clifl-Dwellings on the Rio de Chelley.

# CHAPTER XIII.

## THE RELIGIOUS LIFE AND WORKS OF THE CLIFF DWELLERS.

Much has been written concerning the religious customs of the Pueblos, and several persons have made these their special study and have brought out some very interesting facts.*

The information which we have secured from these various sources shows that the Pueblos were exceedingly religious and that their architecture, art, domestic life, social state and tribal organization were very much influenced by the religious notions which they inherited from their ancestors. Some of these notions and customs may have been introduced after the time of the discovery, yet the supposition is that they were practiced by the Cliff-dwellers and Pueblos, who were the same people; and the information which we have received from them will apply equally to the unknown people. Let us then give attention to the facts brought out:

We may say that the American explorers have learned, during the last ten or fifteen years, more about the religious customs of the people than the Spanish missionaries did in three hundred years. The early Spanish explorers, to be sure, noticed some of the "peculiar structures, to which they gave the name of estufas or hot-rooms," which were the religious houses and places of assembly, and wrote of them as existing in every village or pueblo which they visited. They wrote also of the peculiar custom of hailing the sun every morning at its rising, a custom which is still present and which they call preaching; the following is the description given by Castaneda:

> "They do not have chiefs, but are ruled by a council of the oldest men; they have priests who preach to them, whom they call papas; these are the elders. They go up to the highest roof in the village and preach to the village from there, like public criers, in the morning when the sun is rising—the whole village being silent and sitting in the galleries to listen. The estufas belong to the whole village. It is a sacrilege for the women to go into the estufas to sleep. They burn their dead, and throw the implements used by them in their work into the fire with their bodies. The young men live in the estufas, which are in the yards of the village; they (the estufas) are

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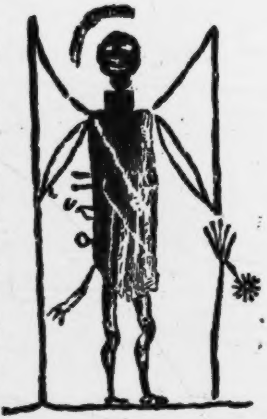
* (Among these explorers are the following: Mr. F. H. Cushing, Mr. J. Walker Fewkes, Dr. Washington Matthews, Mr. A. M. Stephen, Mr. Jas. A. Stevenson, Mrs. Matilda C. Stevenson, Major W. J. Powell. All of these persons have been permitted to witness the secret rites and sacred ceremonies which are still practiced by the different Pueblo tribes.)

(Mr: F. H. Cushing was initiated into one of the secret orders of the Zunis and was baptized by one of the Zuni chiefs in the waters of the Atlantic Ocean, while on an eastern tour with these chiefs: Dr. Washington Matthews was permitted to witness the sand-paintings of the Navajos and learn from these their peculiar notions as to the nature powers, and the superstition as to the efficacy of prayer and sand paintings combined in healing the sick and expelling the evil spirit of disease. Mr. J. Walter Fewkes has made a special study of the religious dances, dramas and symbols of the Tusayans. Mrs. Matilda C. Stevenson has made a study of the mythology of the Sias, a tribe living near the Rio Grande.) The reports of the Ethnological Bureau contain these descriptions, with many plates and illustrations.

underground, square or round, with pine pillars; some were seen with twelve pillars, and with four in the center as large as two men could stretch around. The floor was made of large, smooth stones like the baths of Europe. They have a hearth made like the binnacle[*] or compass-box of a ship, in which they burn a handful of thyme to keep off the heat, and they can stay in there just as in a bath. The top was on a level with the ground. The houses belonged to the women, the estufas to the men."



MONTEZUMA.

I. Various stories have arisen in reference to the religious customs. One is that the eternal fire was kept alive by the priests who never left the estufa, and the superstition was that if the fire went out the life of the people would become extinct. Another is that Montezuma, the great chief, had predicted the coming of the white men, and that when they came the customs would be changed. This story was connected with the figure of the tree, which was found inscribed on the rock near a sacred spring, but seemed to be planted with branches downward; the prediction was that this symbolized the condition of the people after the whites should arrive.

This story is similar to the one which is so common among all the American tribes, uncivilized and civilized, and which recounts the exploits of a person who is represented as actually having lived among the people but was a sort of Culture hero, a Shaman or Medicine Man, and at the same time a Divinity similar to the Messiah of the whites. The tradition is that his name is "Poseyemo,"—"Moisture from Heaven." He was a poor boy, but was chosen chief, and soon began to astonish the people with prodigies. His fame spread and he exercised a power over many of the Pueblos, very much as the character called "Pope" did during the rebellion against the Spaniards, in 1780, and as Tecumseh and the prophet did in later times. Mr. Cushing identifies him with the Poshamka of the Zunis, who is supposed to have appeared in human form poorly clad, and therefore rejected by men, but who taught the ancestors of the Zunis, Taos, Oraibi, and Coconimo Indians, their agriculture and other arts, their system of worship by plumed sticks, organized their secret societies, and then mysteriously disappeared towards his home in "the mist enveloped city." He is called by the Queres, "Our Father from the East, that cometh together with the sun." He is still the auditor of prayers, the invisible ruler of the spiritual or "unseen city," the "Finisher of our lives." The folk lore connected with him embodies considerable ancient history of the tribes, especially of the Tehuas on the Rio Grande.

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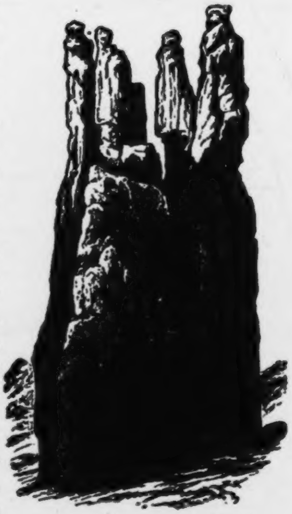
[*] "The binnacle or box of a compass:" refers probably to the circular shape of the fireplace or hearth. See translation of Castaneda's narrative by Winship—14th annual report Bureau of Ethnology, p. 522.

Another story is the one which was told to J. W. Gregg. It is that a gigantic snake was kept in the estufa and was fed with human victims. This story probably came from the custom, which is still in vogue among the Zunis, and which also may have prevailed among all the tribes, of keeping a snake effigy in some of the estufas as a symbol of the rain-god. There was also a story told to Gen. Simpson about the deluge which swept the valley of the Zunis, and threatened to engulf the village itself, which was then on the summit of the mesa; but the people were directed to let down a youth and a maiden from the summit of the cliffs as a sacrifice to the spirit of the water; when they reached the water the flood subsided, but left a mark high up in the side of the cliff which may be seen to this day. The youth and maiden were transformed into stones, and the images of them are still pointed out on the summit of the cliff near by.


TRANSFORMED YOUTHS.

These stories give us hints as to the superstitions which formerly prevailed; they however very poorly represent the religious systems of the Cliff Dwellers or Pueblos.

The story of creation is, however, more instructive. This is found among all the Pueblo tribes, including those on the Rio Grande and on the Gila, and the Zunis and Moquis and others. It prevails among the so-called wild tribes, the Navajos and the Pimas, and even the Apaches. It will be well to follow up this story as told by these different tribes, and see how much there was in common between them and yet how many things were different. The contrast is due to the ethnic affinities and training of the tribe, and especially to the coloring which was drawn from the scenery, but the resemblance shows that the story was transmitted from tribe to tribe.

The following is the Navajo version as told by Dr. W. Matthews:

> "Our fathers dwelt in four worlds before this. In the first it was dark and small; in the second they found the sun and moon and different colors—south, blue light; west, yellow light; in the north, white light; in the east, darkness. In the third world they found a land bounded like

their present home, by four mountains—San Mateo, Salt Lake, San Francisco and San Juan. The flood came and took soil from all the four mountains and placed it on the mountain of the north, which began to grow higher and higer, and the people climbed upwards to escape the flood, the water following them. They planted on the summit a great reed and through this they escaped. In the fourth world they found the mountains and seas the same as in the third world, but a great river ran through the center; on this they settled. When they came to the fifth world they found a great lake, and on the lake four swans—a black swan in the east and a blue swan in the south. Still they were in trouble for they could not reach dry land; they prayed to him of the darkness in the east; he with his horn cut through the cliffs and he made a canon through which the waters flowed away. The land was still soft and muddy; they prayed to the four winds which came and blew a gale, and the ground became dry so they could walk on it. The sun and moon went into the heavens—one began to shine in the day, and the other in the night."

Another story involves the creation of the light and the rising of the sun:

"The light was made from a white shell and a greater light from the turquoise. Eagle plumes were placed upon the turquoise and the shell, and a crystal was held over them and the plumes were lighted into a blaze. On the surface there were twelve men living at each of the cardinal points, and two rainbows crossing one another made the canopy of the heavens. The heads and feet of the rainbow almost touched the men's heads. The first task was to raise the sun in the sky, for it was too near; it burned the vegetation and scorched the people. They made the attempt, but the sun tipped. At last they called upon the twelve men at the cardinal points and said, 'Let us stretch the world.' The men blew and stretched the world and lifted the sun and saw it rise beautifully, and then went back and became "the holders of the heavens."*

Among the Navajos the story was symbolized by the Kiva, which was always in the shape of a hemispherical hut which had the humanized rainbow painted upon its surface—the feet upon one side and the head upon the other—the doorway being made up of different colored skins, white representing the daylight, the blue the dawn.

The Zuni tradition is interesting. It is as follows:

"The people were led up from the lower world by two war-gods—Ashalti and Maasewe, twin brothers, sons of the sun—who were sent by the sun to bring the people to his presence. These gods occupy important positions in Zuni mythology.

"Another story is that a brother and sister dwelt together on a mountain, but were transformed—the youth into a hideous looking creature, the maiden into a being with snow white hair. The youth descended the mountain, swept his foot in the sands of the plain, immediately a river flowed and a lake appeared; in the depths of this lake a group of houses, and in the center of the group an assembly house or a Kiva, provided with many windows.† This lake contains the waters of everlasting happiness and the village is the final abode of the blessed, and the passageway to it is through the mountains."

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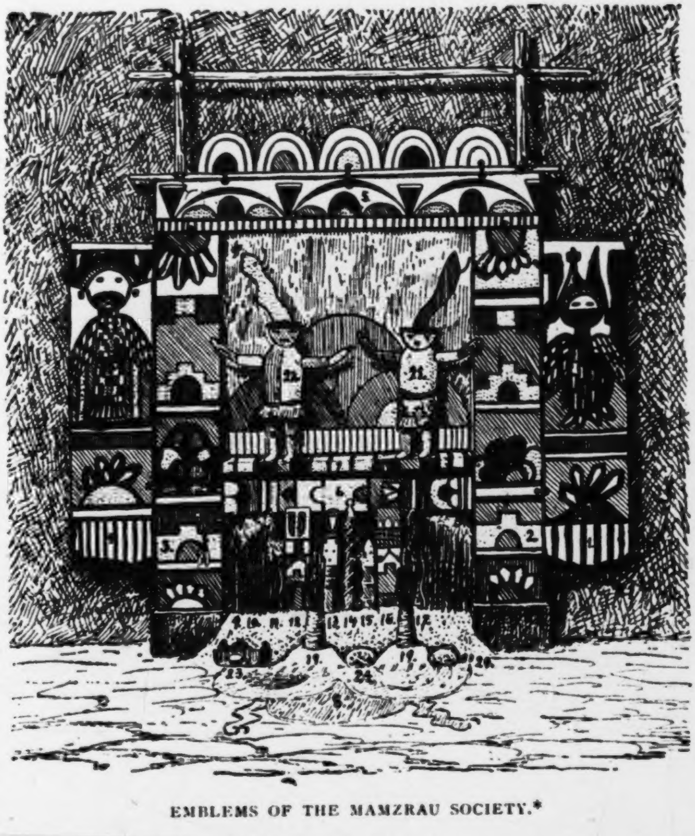
* This expression reminds us of the Scandinavian myth of the dwarfs who hold up the heavens.

† The first of the Zuni to cross this river were the bear gens, the corn gens, and the sand hill crane gens.

II. A more reliable source of information is that which is furnished by the secret societies which various American explorers have been permitted to join, but from which the Spaniards were excluded. These societies probably have survived from prehistoric times, and perpetuate the myths then prevalent. Each of these different societies has its own lodge or estufa; thirteen among the Zunis; eight among the Sias; seven among the Tusayans. They are named after animals, such as snakes, ants, birds, beasts of prey; such as bears, cougars, wolves; they are subdivided into bands which represented the cardinal points and held esoteric relations with the cloud peo-



EMBLEMS OF THE MAMZRAU SOCIETY.*

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*In the screen of the Walpi we find the same symbols of the rain clouds, the sky arches the lightning serpents, sun emblems and corn maids. These symbols of widely different societies refer to the fertilization, growth and maturity of corn, and the effect of the rain clouds and the nature powers. There are representations of "supernaturals," male and female culture heroes and corn maids.

ple, also with the sun and moon, with the earth and the elements. The members had their bodies marked with emblems which represented these various objects, such as crescents, stepped figures, spots, circles, etc. They have their altars and sand paintings, their theurgic rites, their medicine ceremonials and rain ceremonials, and their mythologies, which are very carefully guarded.[*]

These ceremonies consist in the use either of live serpents or of serpent effigies, in connection with rain symbols, and various personages who are tricked out in strange costumes and paraphernalia, and were generally celebrated in the estufas. It was at the initiation of the children into the clan that the most impressive ceremonies were observed. At this time the priests carried the snake effigy from the springs of water up to the pueblos and deposited it in one of the estufas, to be kept over night; in the morning it was carried by certain persons who represented the cloud divinities and supernatural beings, with great ceremony and was held over the opening in the roof of the kivas, and water poured through it into the vessels which were held by other priests, as they stood on the floor of the kiva below, and distributed it to the children at the time of their initiation. This water was in a measure sacred, and was regarded as the water of life, for it was supposed to come from the clouds, and through the mouth of the cloud divinity. It was through this same snake effigy that all the seeds which were to be planted, and were to furnish food for the people, were poured into the baskets which were held by the priests as they stood below the opening in the roof of the kiva. These seeds were also carried to the children as they sat upon the ledges, beside their grandparents or the elders of the tribe, and were considered as signs of the favor of the cloud divinity. Surrounded as they were by the fetiches or animal effigies, which symbolized the divinities of the sky or the gods of the celestial spaces, the children, from the earliest age, learned to look at the powers of nature as emblems of divinity and full of the supernatural beings. They were taught that the breath which came to them from the prayer plume, as they sat in the sacred place, was the very breath of the divinity, and they must breathe this in if they are to be received, or have entrance into the beautiful city, or pueblo, beneath the water of the sacred lake.[†]

Captain Bourke speaks of the Apache medicine shirt as containing figures of serpents which show that there was a similar superstition about the serpent among this wild tribe, though there was no record of any ceremonies, or even of any kiva or estufa resembling those common among the Pueblos. This will show that whatever may be said about the Navajos, the Apaches belonged to a different tribe and stock from the cliff-dwellers, and were probably their enemies from time immemorial.

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[*] (These societies have been described at great length by J. Walter Fewkes and Mrs. M. C. Stevenson, Dr. W. Matthews, F. H. Cushing, and others. The Dakotas have secret societies which are religious in character and are distinguished by the name of animals; they also have their lodges, but they are constructed of poles covered with skins, or with sods above the surface, while those of the Zunis, Moquis, and other Pueblo tribes, are constructed of stone or are excavated out of the rocks. It seems probable that there were societies similar to these among the cliff-dwellers, as their rock-shelters, shrines, rock inscriptions and estufas seem to embody the same myths which are dramatized in the ceremonies by the living tribes.)

[†] This ceremony has been described by J. Walter Fewkes at great length, as existing among the Tusayans. XV. Annual Report Bureau of Ethnology, p. 253. Also by Mrs. Stevenson, as common among the Sias.

The snake dance was another religious ceremony which was observed in connection with many of the secret societies. This was a ceremony which symbolized the religious beliefs of the natives. The snake was supposed to be the symbol of the rain-god, so the live snakes had a supernatural power and a peculiar charm in bringing rain in its season. There were many other ceremonies celebrated by the Tusayans, Zunis, Seris and Navajos, all of them under the charge of the secret societies and at certain fixed seasons of the year. These ceremonies were also practiced by the cliff-dwellers. There were, to be sure, not the same conveniences for observing them, for the houses were high up on the cliffs, yet it is not unlikely that processions were led out from the cliffs and down the ledges, along the valleys to the various shrines where snakes and other animals are still to be seen inscribed upon the rocks. Mr. C. F. Lummis has described a race at Acoma in which the runners followed one another along the front of the pueblo, which stretched for a thousand feet in length, and then down the steep pathway. Mr. Fewkes has described a ceremony called the flute dance, and another called the antelope dance, both of which were out-of-doors and had to do with the seasons and the operations of nature.

Mr. James Stevenson speaks of the Medicine Lodges or Sweat-houses of the Navajos; they are placed above the ground and are mere lodges, but the sand paintings which are wrought in their ceremonies are very instructive and suggestive. The lodges differ from the estufas and symbols of the Cliff-Dwellers and they suggest an entirely different form of religion and a separate line of religious development.

III. The estufas, or kivas, are very instructive in reference to the religion of the Cliff-dwellers. It has been claimed by some that the kivas, or estufas of the Cliff-dwellers were the earliest buildings of the Pueblos, and that they perpetuate the form of hut or house in which the Cliff-dwellers lived before they adopted the pueblo style of architecture. As the villages grew and became compacted into great villages or Grand Houses, the estufas changed their shape and came to assume the square or oblong shape, similar to that of the Pueblos They have been the objects of curiosity with all explorers, and some parts of the estufas have been a great puzzle.

Mr. W. H. Holmes, as early as 1875, noticed the circular rooms in the midst of the cliff-dwellings, and called them estufas. He gave a full description of the one on the Rio-de-Chelly, and noticed the "box-like" ledges in the wall, also the narrow opening which he imagined was the entrance to the estufa, though it has since proved to be an air chamber for ventilation. He did not connect the estufas with the rock-paintings or shrines, nor did he ascribe the circular form to the mythology which prevailed among the cliff-dwellers.

It was reserved for the later explorers, such as Mr. F. H. Chapin, Mr. Nordenskjold, and Mr. Mindeleff, to discover the existence of the ledges and the piers, and to perceive the use of the opening in the wall, which was really a flue or air-chamber, designed to ventilate the room and carry off the smoke, rather than as an entrance. Mr. F. H. Cushing has given the best interpretation of the different parts of the estufa. He says that the different piers which are found in the walls and which separate the ledges, represent the six supports of the sky, and that the whole estufa was built so as to be symbolic of the sky with its four corners, and the zenith and nadir. The circular form represented the sky; the roof and fire-place represented the elements above and below; and the opening in the floor represented the place of beginning or "emergence." Thus the mythology of the cliff-dwellers was embodied in the estufa. This mythology has been described by Dr. Washington Matthews: it is to the effect that at the earliest date the human beings were confined in a dark cave below the ground; but the divinities took pity upon them and let the light, by degrees into the cave, in answer to their prayer. The people then managed, by the aid of certain animals, to secure an opening in the roof, and by means of a reed which was inserted in the opening, or, according to another version, by means of a ladder made from a pine tree, were able to climb up

ESTUFA WITH PIERS IN ACOWITZ CANON.

from the dark cave. This occurred four times, the abode of the people becoming lighter and lighter as they ascended. There is another part of the story in which it appears that the waters of the deluge followed the people up through the opening in the cave and flooded the valley, and it was only after a long time that the land became dry enough for the people to cross it. The mythology of the Navajos and other living tribes may be used to explain certain parts of the estufas, but care should be taken lest we mingle the later myths with the earlier, and ascribe the white man's traditions to the aborigines. We may say that the architecture of the estufas of the cliff-dwellers, with its six piers and its ledges, its circular place in the center where was the fire, its ladder which was placed over the fire, and the double opening to the roof, embodied the myth of creation as well as the superstitions in reference to fire. It reminds us of the construction of the rotunda among the Muskogees of the Gulf states, in which the fire was kept burning while the council was being held, the spiral column being to them a tribal symbol. It also reminds us of the temples of the Mayas which were placed on the summit of a pyramid guarded by snake effigies which seemed to descend from the sky and symbolized the rain-god. There is no doubt that the estufa, or sacred chamber, was used by the Cliff-dwellers to commemorate their past history as well as to remind them of their dependence upon the rain divinities, inasmuch as ornaments or painted bands have been discovered on the walls of some of them.* That they were places of social resort for the men is evi-

ROUND HOUSE IN ACOWITZ CANYON.

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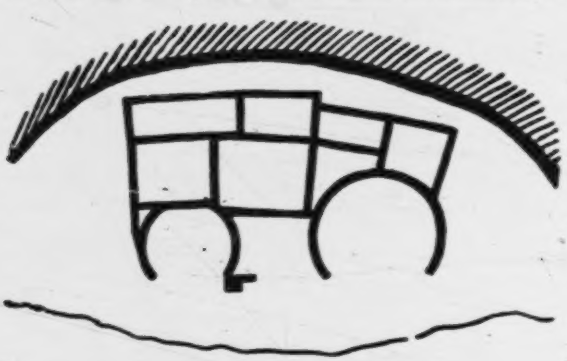
* The piers and ledges are always present and constitute the chief features of the kivas of the Cliff-dwellers. The kivas of the tribes to the south, such as the Tusayan and the Zunis, do not seem to have retained these piers.

dent, from the fact that they are placed near the cliff-villages. They were used probably as council houses as well as for the meeting of the secret societies, but they were also used as a workshop by the industrious and as a lounging place by the idle. There are still traces of the two classes of kiva; one contains the sipapuh or place of emergence, the other class has piers or ledges. The kiva with the sipapuh is not found among the cliff-dwellers, ??? that we know of, but is found among the Zunis, Moquis or Tusayans, and so suggests a different origin. Another interpretation of the estufa, found among the cliff-dwellings, is that the walls are divided into ledges and square pillars or piers, six in number, with design to represent the four cardinal points, and the zenith and nadir, as well as the four caves through which the ancestors of the people came before they reached the surface of the earth. The piers may possibly represent the four mountains, which, according to the mythology, were recognized before they reached the surface and afterwards constituted the bounds of their habitat. If this is so, it shows that the Cliff-dwellers and the Pueblos occupied the same general territory in pre-historic times and had the same mythology. A myth to the same effect prevails among the Jicarilla Apaches, a tribe which is situated far to the north, near the head waters of the Rio Grande, and is of diverse language and origin from the Pueblos, but was once located near the Pueblo village of Taos; they retain a similar myth about the flood. This tribe mention the four mountains—one west of the Rio Grande, one to the east, and one to the southwest, also the Sierra Blanca, to the southeast. He



Plan of 1st CLIFF DWELLING Mancos Cañon.

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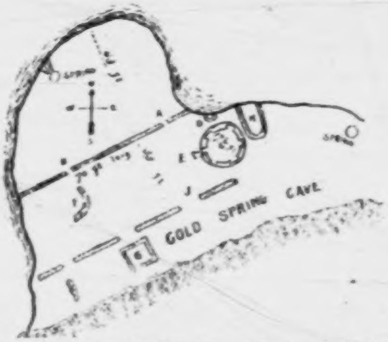
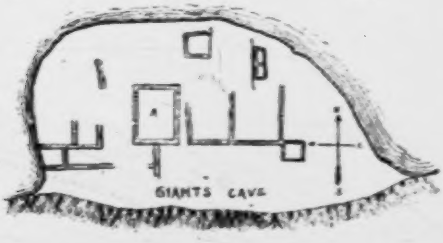
The cut represents the six room cliff village called by Mr. Chapin the Sandal Cliff House. It was the place near which the Wetherills discovered the largest number of relics.

made also four great rivers and gave them their names—in the north, the Napeshti, "flint arrow river" (the Arkansas); in the west, the Chama. He made other rivers but he did not give them names and he gave the country to the Jicarillas.* The fact that this myth or tradition of the creation is associated by this tribe with the pueblo at Taos, explains the word which was placed upon the map given by the Indians to Gen. Whipple; this word was Sipapu, or place of emergence, and the story was that from this place the Pueblo tribes originated



CLIFF VILLAGE WITH ESTUFA AND SPRING IN A CAVE.

It is to be noticed that the location of the kivas of the Cliff-dwellers generally are separate from the domestic apartments.§ Sometimes they are placed on the summit of the mesas above the cave dwellings, and occasionally they were on the same ledge but at one extreme of it, though on the same level with the houses. In some villages the estufa was in the very center of the village; the entrance to the village was close by. The usual method was to place the kivas on the sides of the cliff with the openings in the roof on the level with the ledge, so that they could be entered from the top without going up to the apartments or going down the cliffs.



CLIFF VILLAGE WITHOUT ESTUFA.

They were often in front of the houses and thus might serve as quasi defenses for the villages, though there were towers separate from the kivas which served as citadels, and occasionally rooms high up in the cliffs where the warriors gathered and shot arrows through the loop-holes in the walls. There seems to have been a division of the people into several classes, each of which had separate apartments; these were as follows: 1. The women and children were gathered into the square rooms, which were built compactly and clustered together on the mesas or along the ledges in the cliffs. The children are supposed to have occupied the area back of the houses, where they felt comparatively or quite secure, inasmuch as they were hidden from sight by the houses, and were surrounded by those who were constantly on the alert and were interested in their safety. The weaving and the pottery making and basket making fell to the young women, and the cooking or baking the tortillas fell to the older women. The apartments varied in their shape, location and character; they included the storehouses, or caches, which sometimes were placed in the sides of the cliffs, at a distance from the houses. 2. There seems to have been a class of warriors or "braves" composed of the rank and file of the people, who were perhaps directed by the chief or war captain. Some of these were placed in the towers, others in the loop-hole forts, and still others scattered among the different apartments. 3. There was also a religious class, composed of the priests or medicine men, who presided over the sacred ceremonies; the secret societies, their officers and members, each of which had its own lodge and its own symbolism. 4. To these should be added the young men and boys and the men who had no especial work or office. These remained in the kivas during the night and also spent much time in them during the day.

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* Anthropologist for July, 1898, p. 197. Article by James Mooney on the Jicarilla Genesis.

§ This cut represents a cluster of houses and an Estufa and some walls found in a cave in Butler's Wash by Lewis W. Gunckel. The Estufa seems to be the most important part of the settlement. The other shows the difference between temporary retreats and permanent villages as the Estufa is always present in a permanent village, but rarely in a summer resort.

The manner of constructing the kiva was also very significant, as each part was supposed to be sacred, and so the utmost care was observed, The whole structure, when finished, was consecrated as most modern temples and churches are. There have been many descriptions of this, though that given by Mr. Ad. F. Bandelier is the most definite, which we quote:

"The ancient kivas of the Cliff-dwellers were generally round, had the fire in the middle, the entrance above the fire, but the seats were deep ledges or shelves, which symbolize the six spaces. The Sipapuh or opening has not been discovered thus far in these kivas, though the air chamber or passage, which is common, is found in nearly all. The ceremonial room among the Tusayans is separated from the dwelling, and is subterranean, but generally located at points where the depressions already existed.

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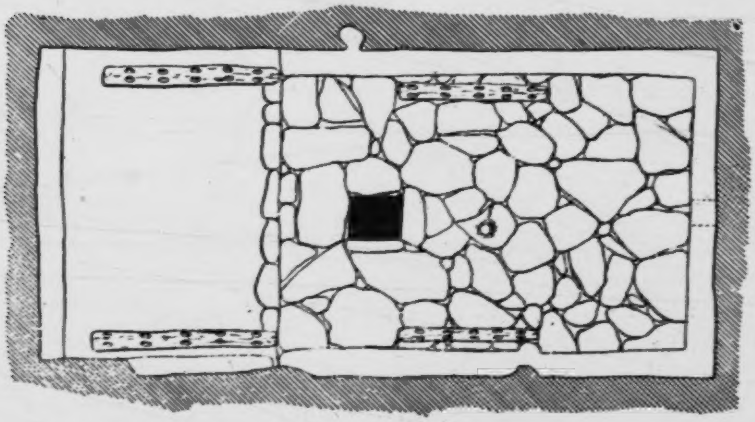
The position of the kivas, as related to the pueblos, seemed to vary in different localities Among the Cliff-dwellers, as Nordenskjold has shown, they are frequently placed in front or to one side of the dwellings. Among the ancient pueblos on the Chaco, they were placed in the court and along the lines of the houses, and generally raised above the surface; among the Zunis they were sunk beneath the floors in the midst of the apartments of the pueblos; among the Tusayans they were sunk beneath the surface of the rock. Mr. Bandelier says: "At the present time some of the kivas of the Zunis occupy marginal positions in the cell clusters, just as in many ancient examples."

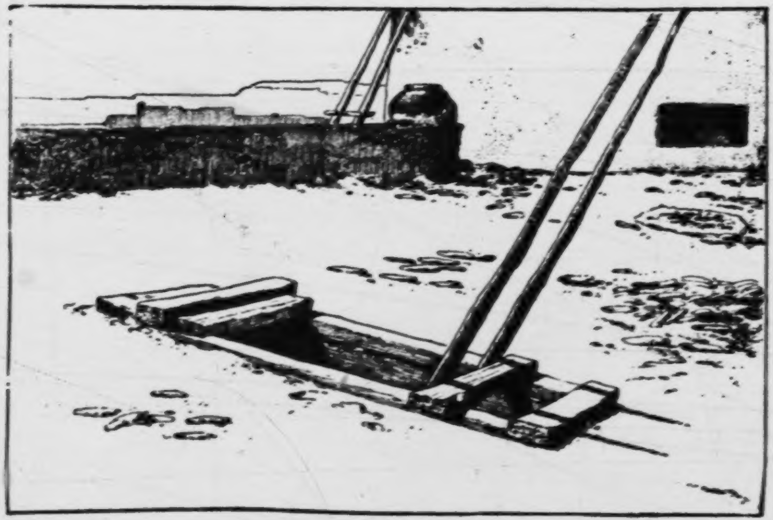
These depressions were near the margins of the mesas. The construction of their villages on the rocky promontories forced the Tusayan builders to sacrifice the traditional and customary arrangement of the kivas within the house inclosed courts of the pueblo, in order to obtain properly depressed sites.

"In such cases the broken out recesses in the upper rocks have been walled up on the outside, roughly lined with masonry within, and roofed over in the usual manner. In many cases the depth of these rock niches does not project above the level of the mesa summit, and its earth-covering is indistinguishable from the adjoining surface except for the presence of the box-like projection of masonry that surrounds a trap door and its ladder. Examples of such subterranean kivas may be seen at Walpi and elsewhere. Even when the kiva was placed in the village courts or close to the houses, naturally depressed sites were still sought in conformity to a general plan of ancient practice. The kivas were supposed to perpetuate the tradition of the creation, and the underground chambers symbolized the caves through which the ancestors of the race passed on their way to the surface. The native explanation is as follows: In the floor of the typical kiva is a sacred cavity called Sipapu, through which comes the beneficent influence of the deities or powers invoked. According to the accounts of some of the old men, the kiva was constructed to inclose this sacred object, and houses were built on every side to surround the kiva and form its outer wall. In earlier times, too, so the priests relate, people were more devout, and the houses were planned with their terraces fronting upon the court, so that the women and children and all the people could be close to the masked dancers as they issued from the kiva. The spectators filled the terraces, and sitting there they watched the dancers dance in the court, and the women sprinkled meal upon them while they listened to their songs. Other old men say the kiva was excavated in imitation of the original house in the interior of the earth, where the human family were created, and from which they climbed to the surface of the ground by means of a ladder. The hatchway is also constructed after a fixed plan. Near the center of the kiva two short timbers are laid across the beams about five feet apart, leaving an open space of about five by seven feet in the roof or ceiling. The hatchway is then raised to the surface of the ground, and over the top of it short timbers are placed, one end higher than the other, so as to form a slope; upon these timbers stone slabs are laid for cover, leaving an open space



FLOOR OF THE KIVA.

about 2x4½ feet, which is the only outlet for the kiva. The reason for this construction of the hatchway is to give more height to the room above the fire, which is always placed immediately beneath the hatchway. The roof being finished, a floor of stone flags is laid and at one end is raised a platform some ten or twelve inches high, extending about one-third the length of the kiva, and terminating in an abrupt step just before coming under the hatchway. (See Figure.) On the edge of the platform rests a long ladder, which leans against the higher side of the hatchway and projects ten or twelve feet in the air. Upon this platform the women or visitors sit when admitted to witness any of the ceremonies, just as the women stand on the house terraces to witness a dance, and do not step into the court. In the main floor a shallow pit, about a foot square, made for a fireplace, is located immediately under the hatchway, and is usually two to three feet from the edge of the second level of the floor. Across the end of the kiva on the main floor, a ledge of masonry is built, usually about two feet high an done foot wide, which serves as a shelf for fetiches and other paraphernalia during stated observances. In this bench or ledge is a small niche or opening which is called the katcina house, for the masks are placed in it when not used by the dancers. This is called the altar end of the house.



OPENING TO THE KIVA.

In the main floor of the kiva there is a cavity about a foot deep and eight or ten inches across, which is usually covered with a short, thick slab of cottonwood, whose upper surface is level with the floor.[*] Through the middle of this short plank and immediately over the cavity, a hole of two or two and one-half inches in diameter is bored. This hole is tapered, and is accurately fitted with a wooden plug, the top of which is flush with the surface of the plank. The plank and the cavity usually occupy a position in the main floor of the kiva. This feature is the Sipapu, the place of the gods, and the most sacred portion of the ceremonial chamber. Around this spot the fetiches are set during a festival. It typifies also the first, world of the Tusayan genesis and the opening through which the people first emerged. It is frequently spoken of at the present time."

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[*] The figures illustrate the general plan of building the roof, ceiling, walls, floors, fireplace seats or ledges, and the openings or place of entrance of the modern kivas.

"The essential structural features of the kivas above described are remarkably similar, though the illustrations of types have been selected at random. Minor modifications are seen in the positions of many of the features, but a certain general relation between the various constructional requirements of the ceremonial room is found to prevail throughout all the villages.

"The consecration of the kiva is also significant. When all the work is finished, the kiva chief prepares a "bahó" and "feeds the house," as it is termed; that is, he thrusts a little meal, with piki crumbs, over one of the roof timbers, and in the same place inserts the end of the baho. As he does this, he expresses the hope that the roof may never fall and that sickness and other evils may never enter the kiva. It is difficult to elicit an intelligent explanation of the theory of the baho and the prayer ceremonies in either kiva or house construction. The baho is a prayer token; the petitioner is not satisfied by merely speaking or singing his prayer; he must have some tangible thing upon which to transmit it. He regards his prayer as a mysterious, impalpable portion of his own substance, and hence he seeks to embody it in some object, which thus becomes consecrated.

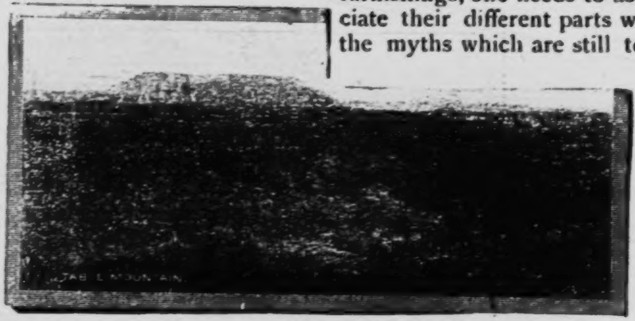
"The prayer plume, or 'Baho,' consisting of four small feathers attached to willow twig, is inserted in the roof of the kiva in order to obtain the recognation of the powers. They are addressed to the chiefs who control the paths taken by the people after coming up from the interior of the earth—a yellow to the yellow cloud and to the west; a blue feather to the blue cloud and to the god of the south; a red feather to the red cloud and to the east; a white feather to the white cloud and to the north. Two separate feathers are addressed—one to the zenith, the invisible space of the above, and to the nadir, the god of the interior of the earth and the maker of the germs of life.

The shape of the kivas varied with the different tribes in the different districts, each tribe had myths traditions and customs peculiar to itself. With the Cliff Dwellers the style was as we now see to build it, in a circular shape with ledges and piers. This, however, was modified and changed so as to place a circular roof in a solid square block of stone—the corners being filled in with rubble. The entrance in both of these was from above, through the roof.

There is a third form found in various parts of the country which consists of a circular tower—sometimes built in one and sometimes two stories—the interior divided into a series of cells arranged in a circle, with a circle in the center for the fire, the cells uggesting that certain ceremonies unknown to us were celebrated. A fourth way of building the kiva is the one which iswell known from the specimen seen on the Gila, and which some think was used as a temple if not as a kiva, the system of worship being different from any other. All of these different shaped kivas have been studied with the idea of tracing the line of development from the original rude hut to the conical stone estufa, and from this to the square structure, and finally to the two-story temple, each stage of development and each new shape of the temple having produced a new form of building.

A still more fruitful line of study would be to compare these religious houses with the various structures found in Europe, such as the open air temples, or Cromlechs, the square tombs or Dolmens, the circular towers and the conical treasure houses, and notice their correlation to the religious system in vogue, and how thoroughly each particular stage of progress is exhibited by them. We would say, however, that nowhere in the world has there been exactly such a religious house as the kiva is, and nowhere has there appeared any such form of worship or system of mythology as was introduced in it. The structure is as unique as the system itself, and both together serve to make the Cliff dwellers and the Pueblos, their successors, a very remarkable people, though no more remarkable than the mound builders on one side or the ancient Mexicans on the other.

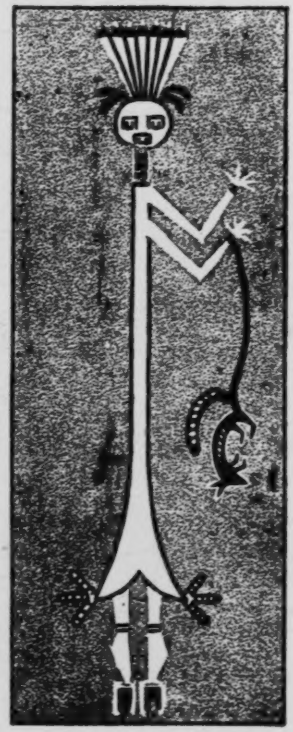
IV. In reading the descriptions of these estufas and their furnishings, one needs to associate their different parts with the myths which are still told by the aborigines of the great plateau; but he needs to remember that the myths vary in their character, as much as do the estufas for those which are told by the Navajoes bring one class of divinities into prominence, and those told by the Zunis another, those by the Apaches still another, each tribe having its own pantheon and as well as its own mythology.



TO-YO-A-LA-NA, THE SACRED MOUNTAIN OF THE ZUNIS.

It will also be noticed that while the tribes regarded the mountains and the lakes as the homes of their divinities, yet each had its own Olympus, or rather its own group of mountains in which the divinities were supposed to dwell—the four prominent peaks always being pointed out as constituting their abode. It cannot be asertained whether the Cliff Dwellers worshipped the mountain divinities, as did the Navajoes, or the personified divinities, such as the Zunis now worship, but they undoubtedly peopled the scene with beings, which were real to them, and which furnished even more sense of power and protection.

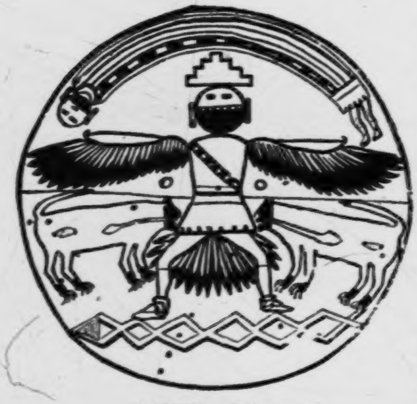
It will be remembered that the scenes with which they were surrounded were very remarkable and they must have had a great influence over their superstitious minds. They could not have climbed to their strongholds in the sides of the cliffs without feeling that their fields were liable to depredations. There must have been a sense of helplessness amid all these dangers. The scenery was also likely to impress them with a sense of awe wherever they went. All of the travelers have spoken of the many points, where distant views can be gained —filling the mind with a sense of grandeur and beauty. Others have spoken of the views which are presented by the deep canons. We may judge from the myths, which are extant among the Navajoes, what a strange effect the colors of the rocks and the sky had upon their minds. Those colors were by the Navajoes embodied in their sand paintings and made to show the drapery with which the mountain and sky divinities were clothed. The figures contained in the sand paintings are explained by the myths which, are extant among different tribes, such as the Navajoes, the Sias, Zunis and Moquis or Tusayans. Their divinities were very much alike in their character, all having sprung from an original pair, though their birth and their activities were within the region which the tribe called its own.



A NAVAJO GOD.

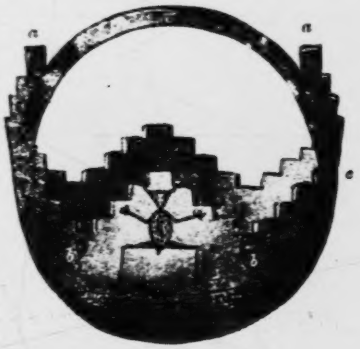
The nature powers were personified by each of the tribes. The clouds, the mountains, the lightnings, the plants, the sun beams and the spray, all were represented as supernatural beings, who were clothed with beautiful colors similar to those of the sky and rocks and the sunlight. Shells, crystals and mosses were used to decorate the persons of their gods — and all were represented by their sand paintings, the myths which are still told, giving an explanation of the paintings. It is interesting to take these myths and compare them with one another, and with those told by other nations, Greeks, Scandinavians and Hindoos.

There was in all a first pair, but generally two brothers are very prominent and serve as the chief divinities. These brothers among the Navajoes have the strange names, Hasjelti and Hostjoghon, They were born on the mountain where the clouds meet, from the union of the sun-god and the shell-woman. These were the great "Song-makers." They gave songs and prayers to the mountains, and clothed the mountains with the colors and clouds which they now bear. They float on the sun-beams which are arranged into a raft in the form of a cross and which has the different colors of the rainbow, but edged with the foam of the ocean. They visited the different mountains: first, they visited Henry Mountain in Utah, and gave to it songs and prayers, and gave to it the color it bears. They next went to Sierra Blanca in Colorado, and gave it songs and prayer and a clothing of white, with two eagle plumes. From here they went to San Mateo (Mt. Taylor) and gave it songs and prayers, and dressed it in turquoise. (This is the color the mountain now has.) They next went to San Francisco Mountain in Arizona, and dressed it in abalone shells with two eagle plumes—(Clouds which float above the peaks) and gave it songs and prayers. They then went to the Ute Mountain and dressed it in black beads with two eagle plumes on its head. Hasjelti is the great mediator. He communicates through feathers, and to him the most important prayers are addressed.

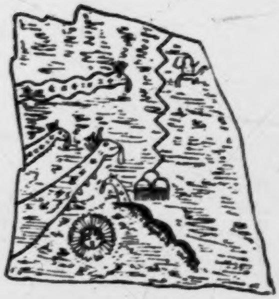

A ZUNI SKY GOD.

He is represented in the sand paintings as clothed in a white garment, wearing white moccasins and having on his head white eagle plumes trimmed with fluffy down from the eagle's breast and carrying in his hand the squirrel bag. He is attended by certain gods, which are called Naaskidi. These are hunch-backed; but their backs represent the black clouds and so are black, streaked with lines of white sunlight and trimmed with white feathers. They bear a lightning staff in their hand which is their great ensign of power.

In many of the sand paintings there are gods which stand upon a cross, making it to resemble the Suastika. They are surrounded by the humanized rainbow. They watch over the plants which draw their sustenance from the central waters. They wear around their bodies, skirts of red sunlight adorned with sunbeams. They have ear pendants, armlets and bracelets of turquoise and coral. Their arms and legs are black, but streaked with white, symbolizing the zigzag lightning across the black clouds. In one case, four goddesses are attended with four plants—the cornstalk and the four plants make a double cross, the plants one and the goddesses another—eight arms to one cross. These are all colored and represent the different points of the sky; that on the east is white and has by her side the white cornstalk; the goddess of the south is blue, and has by her side a blue beanstalk; the one on the west is yellow and has a yellow pumpkin vine by her side; the body of the goddess of the north is black and has the black tobacco by her side. These sand paintings were made by the Navajoes and show the religion of that tribe which consisted in the worship of the mountain divinities. It differed from the religion of the Zunis, the Sias and the Tusayans who worshipped the sky and cloud divinities and represented them differently. It appears that the Navajoes rarely gave wings to their gods or goddesses, but generally represented them as sailing upon rafts of sunbeams while the Zunis gave wings to their gods and placed turreted caps on their heads, though the humanized rainbow generally spanned the sky above, and the lightning hurler was below. They are bird men, but are attended by animal gods. They had not, however, reached that stage in which personal anthropomorphic gods were worshipped as they were in Central America and Mexico.

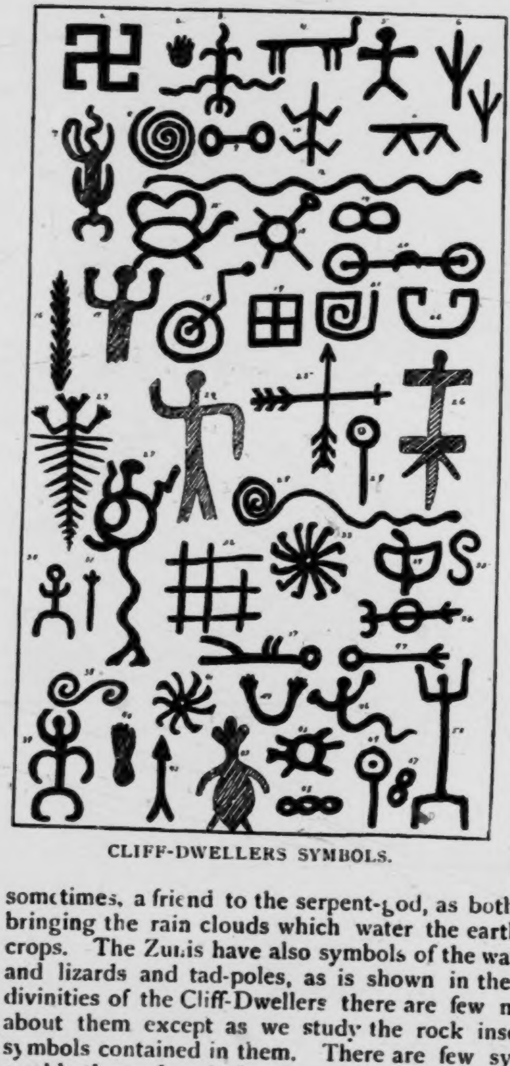


ZUNI SYMBOLS.



ZUNI CLOUD BASKET.

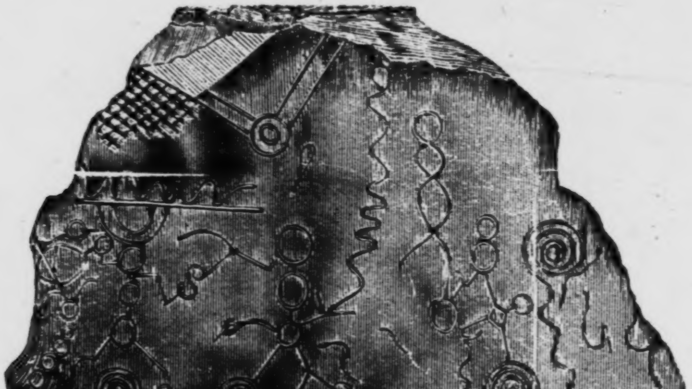
Now, the question arises, which form of religion did the Cliff-Dwellers possess? Was it that of the Navajoes which consisted in the worship of the mountain divinities or that of the Zunis, which consisted in the worship of the water divinities? In answer to this, one can only refer to the symbols which are found upon the rocks near the Cliff-Dwellings. Thus far no image, with knife-bladed wings has been found either inscribed upon the rocks or the pottery relics of the Cliff-Dwellers, nor has there been seen any humanized goddesses standing on crosses or rafts, and as yet not even the O-mo-wuh, which is the symbol of the rain cloud.



CLIFF-DWELLERS SYMBOLS.

This winged figure called the "Priesthood of the Bow," is very suggestive. It reminds us of the gods of the Assyrians, many of whom have birds' heads and wings. It also reminds us of the Egyptian symbol of the winged globe, as the head is like a disk and the wings are always spread. There are winged figures among the tribes on the northwest coast. Yehl, the chief god, is a bird with wings outspread, which contends with the whale.

The Dakota and Algonkin tribes also had as their chief divinity, a thunder-bird, who was a sky-god, but he was the eternal foe to the serpent who was a water-god. The Zuni-bird-god was, sometimes, a friend to the serpent-god, as both were united in bringing the rain clouds which water the earth and so help the crops. The Zunis have also symbols of the water animals, frogs and lizards and tad-poles, as is shown in the cuts. As to the divinities of the Cliff-Dwellers there are few means of learning about them except as we study the rock inscriptions, and the symbols contained in them. There are few symbols which resemble those found elsewhere, such as the suastika which is the symbol of the revolving sky, the coil which is the symbol of the whirlwind, the cross with arrows which is like a weather-vane, as it shows the cardinal points, the consecutive circles and the crescents which are symbols of the sun and moon and also the circle with crooked rays which is the squash flower. There are in the inscriptions many nondescript figures; as for instance, snakes with human heads and arms; lizards with serpents for legs; centipedes with tapering bodies; circles with lightning serpents issuing from them; lizards with claws projecting from the head, reminding us of some of the figures found on the Maya codices; serpents with legs and circles for bodies and human heads. These are all represented in the cut which contains a selection from the different rock inscriptions. It will be noticed that there is no rain symbol, called the O mo-wuh, nor is there any cross with human figures on them, nor even any prayer plumes, but there are many human figures. The nearest approach to any known symbol is found in the concentric circles



ROCK INSCRIPTIONS IN ARIZONA.

which are colored after the usual colors of the cardinal points, and the great number of human hands also colored. The most that we can say is, that those animals which generally are associated with water, such as snakes, lizards, frogs, centipedes, dragon-flies, and water-skates, are very numerous, thus showing that the water was symbolyzed rather than the sky. Still we may say that here is considerable resemblance between these rock inscriptions and those found at Oakley Springs, Arizona, as the same animals may be recognized in each.

In the Arizona inscriptions, the serpents seem to be uncoiling from the sky and descending to the earth, thus symbolizing the rain, while the coils near by symbolize the whirlwind and the looped square above symbolizes the four parts of the sky, the same as it does in the shell gorgets found in the mounds of stone graves of Tennessee.

Figures of snakes are very common among the pictographs on the Mesa, near the Moqui villages. One of these is ten feet long. The head is triangular, with two projecting tongues. The most remarkable specimen is one which is associated with other symbols of the sun, of the clouds and rain. In this snake there are six udders which symbolyze the legend, that all the water and blood of the earth come from the breast of the great serpent. The neck and body are decorated with parallel lines, and arrows, the duck's foot and frog's foot which resemble those found in the serpent symbol in Mexico.

There are rock paintings on the Potrera Chetro where the Delight maker or Medicine man is represented as dancing with a serpent erect in front of him Mr. Gunckel also describes the shrines and boulder sites in which the Serpent is represented in various attitudes and along with the serpent many other symbols. These shrines were places where the dances occur and where the mythologies are depicted upon the walls. One such shrine is underneath a huge boulder, around which was a wall built in a circle. Within the circle and underneath the boulder were rock inscriptions which represented animal figures, serpents and various symbols.* A cave town is described by Mr. Gunckel as having many symbolic figures; the following is the description:

> "It was situated in a wild and beautiful spot, shut in on all sides by high sandstone cliffs except at a narrow entrance; and the foliage is almost tropical in its luxuriance consisting of the cactus of gigantic size, grass and flowering plants, studded here and there with stunted cedars and pinons. Back of the houses was a spring of delicious cold water which issued from under the heavy sandstone ledge and formed a water reservoir in the cave town which is a rare and valued thing in this arid country. The walls of the cavern are covered with picture writings, the most common of which represent the human hand painted in red, white and yellow. In another cave were also circles representing targets, painted in colors; also the figures of serpents, coiled, or springing or crawling; also circles and

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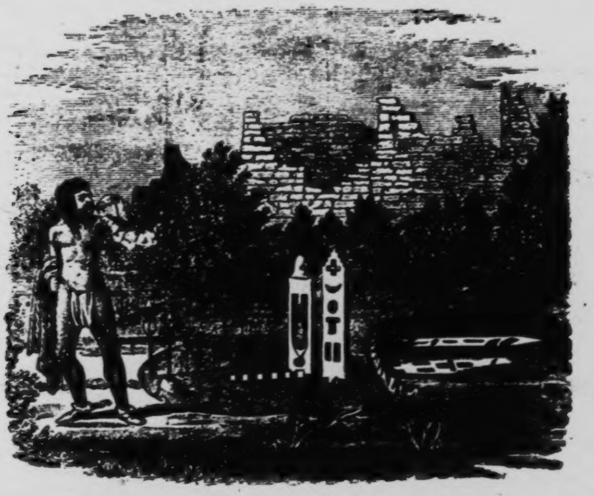
*This village is represented in the cut of "Cold Spring Cave."

snakes combined, symbolizing the lightning dart ; also the figure of a bow and arrow strung to shoot ; these are represented in the cut. Among the specimens of art are fragments of bowls, cups, pegs, and pitchers, and very few specimens are found that are not painted, or covered with raised figures. Among the ornamental designs we found the scroll, the fret, and the stepped figure, in one case the suastika

Mr. C. F. Bickford speaks of rock inscriptions as the Rio de Chelley.

"Hundreds of the shapes of human hands—the autographs perhaps of the dwellers—are found adorning the now inaccessible roofs of some of the caves. They were formed by thrusting the hand into the liquid coloring matter and slapping it with fingers extended upon the rock. Symbols are frequent ; the dragon fly, the rainbow, the sun—objects of reverence to the living Pueblos. Few animals were pictured.



SHRINE AND SUN SYMBOLS NEAR ZUNI.

Mrs. Stevenson describes a shrine which was used by the Sias in which the snake society celebrated its ceremonials.

"It was a rectangular structure of logs, which had a rude fire-place in it, and two niches in the wall, in which stood two vases. The vases were decorated with snakes and cougars upon a ground of creamy tint. The superstition was that the snake was the great divinity and guards the doors to the entrance of the unseen world. There are also six societies, composed of the snakes of the cardinal points, having special influence and special emblems. The serpent of the south had cloud emblems and had influence over the cloud people ; the serpents of the east which were painted with the crescent, had influence with the sun and moon ; the serpent of the heavens, had a body like crystal and was allied to the sun ; the serpent of the earth was spotted over like the earth, and had special relations with the earth. This people have their traditions about the sun, the seven stars, the pleiades, and the constellation of Orion. They say that the cloud, lightning, thunder and rainbow spirits, followed the Sias into the upper world.

These make their homes in springs, which are at the cardinal points, zenith and Nadir, and are in the hearts of the mountains. The water is brought from the springs at the base of the mountains in gourds, jugs and vases, by the men, women and children who ascend from these springs to the base of the tree, and thence through the heart or trunk to the top of the tree which reaches to the sky (tinia); they then pass on to the designated point to be sprinkled. The cloud people are careful to keep behind their masks and assume different forms, but they labor to water the earth. The lightning people shoot their arrows to make it rain the harder, the smaller flashes coming from the bows of the children. The thunder people have human forms with wings of knives, and by flapping these wings they make a great noise. The rainbow people were created to work in *tinia* (the sky), to make it more beautiful for the people of the earth to look upon. Not only the elders make the beautiful bows, but the children assist in the work. They pictured the sun as a warrior wearing a shirt of dressed deerskin, and leggings of the same, reaching to his thighs; the shirt and leggings are fringed; his moccasins are also of deerskin and embroidered in yellow, red, and turquoise beads; he wears a kilt of deerskin, the kilt having a snake painted upon it; he carries a bow and arrows, the quiver being of cougar skin, hanging over his shoulder, and he holds his bow in his left hand and an arrow in his right; he still wears a mask which protects him from view of the people of the earth. An eagle plume with a parrot plume on either side ornaments the top of the mask, and an eagle plume is on either side of the mask and one is at the bottom; the hair around the head and face is red like fire, and when it moves and shakes, the people cannot look closely at the mask; it is not intended that they should observe closely and thereby know that instead of seeing the sun they see only his mask; the heavy line encircling the mask is yellow and indicates rain."

The homage paid by the Zuni to water is illustrated by the symbols at the sacred spring of the Zunis near the ruins of the Ojo Pescado and the present Pueblo Zuni.

"It was between seven and eight feet in diameter and around it a low circular wall 15 x 20 feet across has been raised. The spring is cleared out every year when an offering is made to the spirit of the fountain of one or more water-pots which are placed on the wall. One of these is described as follows: its capacity is about a gallon; a fine border line has been drawn along the edge and on both sides of the rim, horned frogs and tadpoles alternate on the inner surface of the turreted edge; larger frogs or toads are portrayed within the body of the vessel and the crested serpents are also placed at the bottom of the vessel. These represent the animal divinities that are supposed to preside over the springs. Another shrine is described by Lieut. Whipple; it seems to have been sacred to the water deities. The high priest and master of the ceremonies stands in the midst of it; upon the ground is a sacred circle and in this are twigs and arrowheads trimmed with feathers, with threads arranged like a snare supposed to be an invocation for rain. In the midst we find the tablets in which are crescents, crosses and other symbols, all of which show the regard for the nature powers and the sanctity of the sun, moon and stars, as worthy of adoration."

# CHAPTER XIV.

## THE SOCIAL AND DOMESTIC LIFE OF THE CLIFF-DWELLERS.

The religious life of the Cliff Dwellers was the subject of the previous chapter. Their domestic life is next to engage our attention. This is very difficult to learn about, for there are no records to give us information, no traditions even to give us hints, and very few relics are left which can reveal to us their domestic life. All that we can do is to take the various structures which remain, examine carefully the relics which have been found within the cliff-dwellings, and compare the structures with those which are still occupied by the Pueblos farther south, and the relics found, with those in use, and make out from these a picture which shall fit into the framework which is left.

We have intimated that the survivors of the Cliff-Dwellers, or at least their descendants, may be found among the Pueblos, and the more we study the subject, the more thoroughly are we convinced that our conjecture is true; still there have been so many changes in the domestic life of the Pueblos since the advent of the white man—so much conformity to a modern style of life—that we are liable to be misled if we follow these guides too closely.

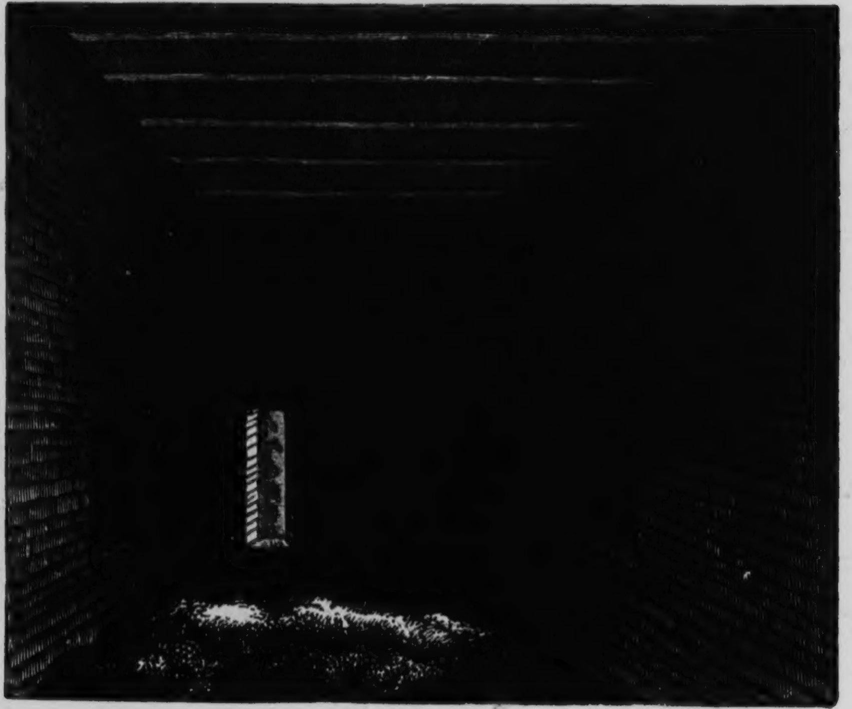
There are, to be sure, the same domestic utensils in use now as in prehistoric times; the same contrivances for grinding the meal, for baking the bread; the same shaped vessels for carrying water and holding grain; the same kind of looms for weaving garments and the same primitive spindles for twisting the cotton fibres. There are also the same fashions, or styles, of wearing the outside garment—as it is still the universal custom to place it over the right shoulder and leave the left arm bare—though the material of which the garment is now made differs entirely from that which was common before the advent of the white man. There is also the same style of arranging the hair, especially among the young women. The fashion still is, to make a large puff on either side of the head. There have been but few changes in the religious customs of the people, for the use of the prayer plumes at the dedication of houses and the celebration of the dances, the wearing of the same hideous masks in the dances, the girding of the loins with the same woven sashes, and decorating the body with the same symbolic colors, still continues. The greatest changes have occurred in the tools used in ordinary employments, for the introduction of domestic animals has brought in the use of the rude solid wheeled cart, and has substituted the common plow for the prodding stick and other contrivances for loosening the soil. The introduction of fire arms, such as the rifle and shot gun, has done away with the bow and arrow, the spear with the stone head, the throwing stick and the war club. Great changes have occurred also in the manner of erecting the walls and fashioning the doors of the ordinary buildings, especially the style of decorating the inner walls of the rooms, as the symbols and ornaments which are so striking in the ruined houses of the Cliff-Dwellers are no longer found in the pueblos. The kivas, or sacred chambers, have also undergone a change. The circular shape has been abandoned, and the oblong, rectangular has been adopted. It is uncertain how long the "Snake Dance" has prevailed, but the snake symbol was evidently in use in prehistoric times, and it is probable that this and other religious customs which now prevail, have survived from prehistoric times, but have greatly changed.

If we bear in mind these changes, and are careful in noticing those things which are peculiar to the Pueblos, and which are not found among other tribes in America, it will be safe for us to take these as clews to the domestic and social life, and perhaps even the religious life, of the Cliff-Dwellers. We do not say that they all prevailed in those northern districts where the Cliff-Dwellers had their homes, but there are so many tools found among the cliff-dwellings, so many symbols inscribed upon the rocks, so many fragments of woven garments, so many strangely decorated pottery vessels, so many rudely fashioned implements of wood and stone which resemble those still in use among the Pueblos, that we are inclined to take them as the key which will unlock the mysteries which are still hidden away among the ruined cliff-dwellings of the north.

It seems strange that so much mystery should hang over dwellings which are so near those which are now inhabited. The valleys of the San Juan and its tributaries, the Rio de Chelly, the Dolores and the Rio Verde, have been often visited since they were first discovered by American travelers. Various expeditions have been fitted out to explore the ruins and gather relics, but many problems remain unsolved. There is the greatest contrast between the two regions; both are situated in the midst of the great plateau and form important parts of the air continent, which arises like a great mansard roof above the rest of the continent; but in one region we have continued sunshine and a scene which is enlivened by a happy and contented people. Here the voice and prattling of children can be heard, and laughter often rings out among the rooms of the many terraced buildings. Young and old cluster together upon the roofs; fathers and mothers and aged grand-parents mingle with youth and make each village lively with their presence. Every house

SICHUMOVI, ONE OF THE SEVEN TUSAYAN VILLAGES.

COURT AT HANO—SHOWING TERRACED HOUSES AND OPENING TO THE KIVA.



HOUSE INTERIOR AT PUEBLO BONITO IN CHACO CANYON.

is filled with a thriving life. In the regions not so very far away, there are deep canyons where the shadows constantly linger. In their midst are ancient and ruined buildings in which not a voice is heard. Silence everywhere prevails, solitude is supreme. Darkness even lingers in the sides of the rocks. The black-winged crow sends out its warning cry against every intruder into its dark domain. The rustle of the leaves of the quaking ash and the whispering of the fir trees make the solitude to be felt. Echoes of the past may be heard in these strange whisperings in the air.

The contrast could not be greater if we were to take the diving suit on board of some great war vessel and plunging over the side, go down into the depths of the ocean to examine the wrecks which lie buried deep below the waters, for there are wrecks in these deep valleys, and even the bodies of those who have perished in the great catastrophe which came upon the people. The framework is all there, but every sign of life is departed; desolation is manifest on every side. Loneliness is the sense which creeps in upon the soil. To trace the domestic life and social conditions of the people who once dwelt in these deserted houses, is a task which we have set before us. We shall use such evidence as we can find.

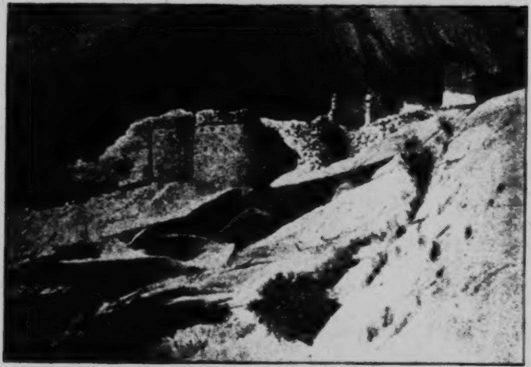
The works and relics of the cliff-dwellings are to be studied in this connection, We have already received their testimony in reference to the military life and religious habits of the people, and have found many things that were suggestive. It may be that the testimony will be as definite in reference to the social and domestic life.

I. We are to notice, *first:* That the architecture of the Cliff-Dwellers differs from any other on the face of the globe; though it is wonderfully correlated to the surroundings, and was well adapted to the life which the people led. The situation of the houses is particularly suggestive of the life which was led. The following is a description of a series of houses which were discovered by one of the last expeditions which entered that region. It was written by Mr. Louis W. Gunckel, who attended the expedition which was sent out by the *Illustrated American;* he, after traversing the upper part of the valley of the Rio San Juan as far as the McElmo and Hovenweep, went on farther west and explored the box canyons which line the sides of the streams which flow from the west eastward, and join the San Juan near the Hovenweep. These ruins have not been described before. They resemble the ruins of the Cliff-Dwellers on the Mesa Verde. They differ in some points—especially in the fact that there are so many ruined towers which have a modern look to them, and certain rock shelters which were probably used for shrines and places of religious assembly—yet the surroundings give the idea that they were the last retreats of the mysterious people whom we call Cliff-Dwellers.

The following is Mr. Gunckel's description:

Monarch's Cave is situated in the beautiful Box Canyon near Butler's Wash, about nine miles from the San Juan. The canyon is about one-half mile in length and presents a great contrast to the monstrous and desolate mesa and valley outside. Instead of stunted sage and grease wood we find a luxurious growth of wide spread cottonwood trees, beautiful shrubbery, flowering plants, and fine clear water, which give to the picturesque canyon a park-like appearance. One cottonwood tree measured fifteen feet around the trunk.

At the west end, the highest sand-stone cliffs, curved in with graceful undulating lines which came close together at the front, their weathered surface forming a large cavern about 100 feet above the bottom of the canyon, underneath which is a striking series of cliff-houses, which from their prominent position we called Monarch's Cave. The cliff-house contained eleven rooms on the ground floor; one of which remains two stories in height. They are accessible on the north side, and there, by footholds cut by the builders in the rocky, sloping ledge. Judging from the large number of port-holes in the ruin, it was built for a fortification. In one room alone we counted twenty-five port-holes, pointing in all directions, up and down, so as to command the whole canyon below. The whole aspect of the cave is one of defense and protection.



MONARCH'S CAVE.

Directly under the cliff-houses, at the bottom of the canyon, is a large spring, measuring thirty feet across and about five feet deep at the center. The water is clear and cold and would serve as an excellent supply at all times of the year, and the stream which flows from it irrigates the whole canyon to the east. At the back of the cave is a little spring where the water trickles down the rock causing a thick growth of moss, ferns and creeping vines. This could be utilized in case of an attack, thus obviating the process of descending to the large cave below. The method of roofing buildings is illustrated in these ruins. Two heavy beams are laid across the top, parallel to each other, for foundation to the roof. A layer, three inches thick, made of small sticks one inch in diameter, is laid crosswise, then a layer of adobe mud three inches thick packed down securely, leaving the impress of fingers and hands in the mud.

The building on the north side is two stories high, the upper story is in a good state of preservation, though the floor has fallen through. The entrance into this room is by a small door from the cave side, which is reached by walking along a cedar log, laid across from the next dwelling, which served as a passage-way or bridge. Above this log a stone protrudes from the building, which served as a step from the log to the door above. A noticeable fact among the ruins is that several doors, neatly made, have been walled up as if a sudden attack was feared and greater defense was needed. In the north end the beams and rafters and small sticks for the roof, remain in a fine state of preservation, dry and hard. They were not smoky and greasy as in other pueblos.

One thing in this cave not found elsewhere, is that the walls in two or three rooms are composed of a mixture of adobe mud and small round stones and sand. They are, however, hard and serviceable and in a good state of preservation.

Five hundred feet to the north of the cave is a small round tower about six feet in diameter, which served as a watch tower, though rudely constructed and without plaster. About one-fourth of a mile east is a series of steps cut into the sand-stone ledge. By using these one is able to reach the top of the mesa, and it is impossible in any other way.

II. There are other features besides that of situation of the cliff-dwellings, which enable us to understand the domestic life and social status of the people. It is understood that the Cliff-Dwellers were the same people who built the pueblos which are in ruins in the vicinity, but for a long time they were compelled to take refuge in the sides of the cliff to escape from the attacks of their enemies, who invaded their houses, and were at last compelled to remove altogether from the region and make their homes with other tribes farther south. They were, even while dwelling in their lofty eyries, in that organized communistic state which required compact villages, or pueblos, for its truest scope, a state in which all departments of life and all the grades of society were blended together, though the domestic life seemed to be the most prominent feature. The military, religious, social and domestic life embodied themselves in different buildings which were crowded into the sides of the cliff, each one having its own province and use. It is to be noticed that the cliff-dwellings were divided into apartments* which differed from one another, not only in the situation but in shape and character,—the use for which they were erected having impressed itself upon their very appearance. It is therefore by studying the various structures which are found in these cliff-villages that we shall learn about the domestic life of the people as we have already learned about their religious, their military, and their industrial life. It may be said that the Cliff-Dwellers lived in villages, each village being a repetition of every other and being made up of the same elements. The only variation was in the relative situation and in the adaptation to a particular location in which they were placed. The peculiarities of the villages consisted of the following:

(1) A row of houses were built on the front of a ledge close to its edge, the wall being a continuation of the precipice; thus

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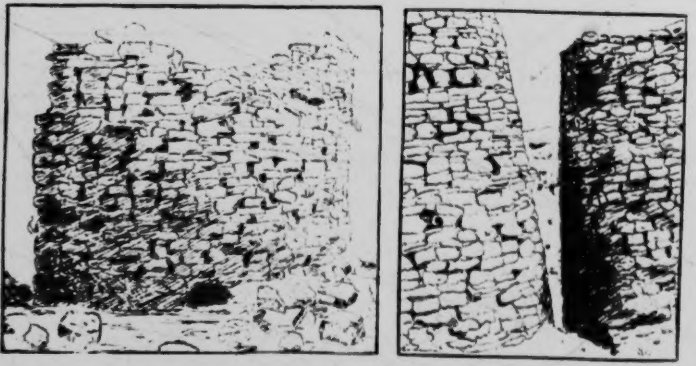
*The towers and "Loop-Hole Forts" were devoted to military purposes, the estufas and shrines to religious, the courts, balconies and roofs to social, the houses and store-houses to domestic, and the cists to funereal.

making a double defense,—its situation in the sides of the cliff and the dead wall making them to resemble fortresses. (2) There was in every village an open space in the rear of the houses which answered the purpose of a court, a street, a playground and a place for industrial pursuits such as weaving and pottery making; the doors of the houses opened upon this street, and the terraces of the houses turned toward the street, very much as in the pueblos they were turned toward the court. (3) There was in every village a series of kivas or sacred chambers which were the resorts of the men, day and night. These kivas were often in front of the houses on the sides of the cliff, but were sometimes in the midst of the houses, or on the same ledge with the houses but to one side of them. (4) There were always in connection with each village one or more towers, which were places of resort for warriors, and which served for the defense of the village. These towers were frequently on the very ledge with the houses and were so situated as to command the front of them, serving as a defense for the villages and as a citadel for the people—somewhat as a garrison does in modern times. These towers were sometimes a short distance from the villages on the cliff above or on the valley below, but were always so placed as to give an extensive view, and protect the village from sudden assault. (5) There were storehouses or caches connected with every village. These were often placed in the



TOWERS ON CLIFF NEAR BUTLER'S WASH.*

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*The towers represented in the cuts were discovered by Mr Louis W. Gunckel. They were situated on the mesa on the edge of a cliff near a box canyon. They were not connected with any compact village, though there were stone houses scattered over the rocky bluffs in the rear, and various shrines and shelter rocks in the canyon below. One of these was a tower without a window and with a single door. It gave the idea that it may have been used as a castle. It had this peculiarity, that it was mainly circular but had one side rectangular, and was called the "One Cornered Tower." The doube tower was near this, and both parts were built with much skill, and with an evident design of defense. It is about the only locality where two-story buildings and towers are scattered over the bluffs, but taken together they constitute a "straggling village." Their location is in the "Ruin Canyon," eight miles west of the McElmo.

niches of the cliff at the rear of the houses, but sometimes in openings or ledges of the cliffs above or below, that were easily reached from the houses. (6) In connection with all cliff-villages there was a stairway of some kind. It either consisted of a series of handholds cut into the sides of the rocks to enable the people to climb up to the villages, or narrow places in the crevices of the rocks, which enabled the people to climb down to the villages, or a series of stone steps which went up the cliff part way and were supplemented by ladders or other contrivances. In a few cases villages were placed on inaccessible ledges, and were only reached by ropes which were suspended from beams which projected from the houses, and were climbed by the people who made their refuge in the rocks. (7) There was a spring connected with every village. This was either situated at the foot or side of the cliff and near the houses, and so furnished water to the people. There were near some of the villages reservoirs which were formed by building walls across low places in the rocks, keeping the water back from flowing into the canyon or stream below, which served as a supply of water in dry times. (8) The evidence is increasing that there were irrigating ditches in the valleys, and near the ditches cornfields and places where beans and squashes were raised. Beside these there were garden plats which were formed by making terraces in the sides of the cliff and depending upon the dampness in the rocks for moisture for the garden stuff. (9) There were near some of the villages shelter rocks and circular walls which were used for dances and feast grounds,and there were other places used for shrines, and near the shrines were many symbols. The religious beliefs of the people are seen inscribed upon the rocks. (10) There were inside of the houses various decorations and ornaments which show the taste of the people who dwelt in the villages. These were probably the work of the women, though there was a conventionality among them which suggest a religious symbolism—the same kind of symbolism that was contained in the decorated pottery. (11) There were also fireplaces inside of the rooms which suggest comfort even when the weather was cold and snow was upon the mountains and in the valleys. (12) There were contrivances by which the storehouses were made inaccessible by stone doors with locks made from withes, which show that the right of private property was not always respected even here. Whole villages were sometimes protected by stone doors, which were set into the narrow passage-ways and barricaded from the inside. These stone doors made the villages secure but when they were placed in the doorways of the rooms they made them very dark, and we may conclude they were rarely used. (13) The most significant element was the doorway which was built in the shape of a **T**, the upper part being wider than the lower. The object of this was to allow the men or women who had loaded themselves with bunches of cornstalks or with vessels of water and had climbed up the cliff, to enter the rooms without taking the load from their shoulders. The doors were not all built in this shape, yet there are enough of them to show that this feature of architecture had grown out of necessities, though it was retained in the pueblos long after the people had left the cliff-dwellings, making it probable that at least some of the pueblos were erected subsequent to the cliff-dwellings.

Here, then, we have the alphabet by which we construct the story of the real life of the people. Every different structure which is situated any where near a Cliff-Dweller's village may be said to furnish us a clew to the social conditions which existed. In some we read their military skill, in others we learn about their religious belief, in others we recognize their industrial pursuits, in others we learn about their domestic habits and ways, in still others, we learn about their amusements, their festivities and their joys.

DOORS AND WINDOWS—SPRUCE PALACE.

The scenery which surrounded the villages needs only the presence of the people for us to read in it all the forms of life which prevailed in prehistoric times. The desire for defense was the first and chief motive which prevailed in every Cliff-Dweller's village. This is seen in the situation of the villages and in the location of the houses. It is seen also in the presence of the towers and the loop-hole forts, and in the many precautions which were taken against sudden assault, but after all, it was the home rather than the land which was defended; and the military skill was exercised to protect domestic life. The home was the chief thing.

Whatever may have been the condition of society before, it is evident that when enemies began to threaten the people, they were driven together into these cliff-villages, and resorted to them as communal houses for purposes of defense. The family may have been separate from the clan, and lived separately, but incursions by neighboring wild tribes, or by hostile neighbors, and constant annoyance, gradually compelled the removal of families and clans to villages which were more easily defended, and forced the aggregation of various related gentes into one group.

These cliff-villages were filled with bands of refugees who were in constant fear of the fierce and savage people who were continually invading their homes, and had driven them into these fastnesses in the rocks. It seems strange that the people under these circumstances could have retained any culture or refinement, or taste, or skill, and the wonder is that they did not degenerate into a race of savages as degraded and as rude as the people who hunted them. And yet, after all, there is such a contrast between the homes which they had left and the rude huts which were still occupied by the tribes which at last drove them from their fortresses, that we are compelled to say that they occupied a different social status and were much superior to them in every way, and especially in their domestic habits and home life.

PLASTERED PILLAR IN CLIFF PALACE.

III. We will proceed now to describe some of the evidences of taste and culture which may be found in the architecture of the Cliff-Dwellers. We call it culture, even if it was rude and barbaric, for the word is always to be taken in a comparative sense. The very fact that stone houses were used to shelter the people and that these houses had doors and windows, and floors, and roofs, is sufficient to prove their superiority. We do not need to compare these with our modern houses to prove that they were superior to the savages, for the very fact that they had them, even in rude primitive forms, would show their superiority. Of course, it is not expected that a Cliff-Dweller would build arches into his houses, or that he would use the column as an architectural ornament, for there are not many modern houses that have these. There were not even piers or lintels in these houses,but in their place may be seen the rude masonry at the sides of the doors and the small poles or sticks above the doors. Still every explorer has noticed the skill and taste with which the walls were laid up, and the beauty which was given to them by the rows of stones which constituted the layers, and by the dressing of the stones so as to make the walls suited for the round towers or the square buildings, thus showing that these ancient houses were superior in these respects to the modern pueblos which are still standing.

There was one contrivance which has attracted the attention of several explorers. It consisted in the placing of a solid stone pillar underneath the floors of a room which constituted the second story of a house, and so made to support the room. The explanation is that as the Cliff-Dwellers were stinted for space and needed an open court in the rear of the houses, they put a single pillar in one case and two pillars in another case, and so made them supports for the upper stories. The cut illustrates the pillar which was found by Mr. F.H.Chapin in the "Spruce Tree House." The following is his description:

> The masonry of the building is all of very good order; the stones were laid in mortar, and the plastering carefully put on, though, as the centuries have elapsed, it has peeled off in certain spots. At the north end of the ruins is a specimen of masonry not to be seen in any other cliff-house yet discovered. This is a plastered stone pier which supports the walls of an upper loft. It is ten inches square and about four feet high. Resting on it are spruce timbers which run from an outer wall across the pier to the back of the cave. Above the pier is a good specimen of a T shaped door, with lintel of wood and sides of stone.

Mr. Nordenskjold noticed the same contrivance in "Spring House," a house which was inaccessible except by a rope which was fastened to a beam and extended down from the house to the side of the cliff below. He says:

> Here two quadrangular pillars were erected to support an extensive roof. It seems to have been customary to leave an open space behind the whole cliff dwelling, and in order to provide support for an upper story without having to encroach upon the space by building walls, the builder erected these pillars.

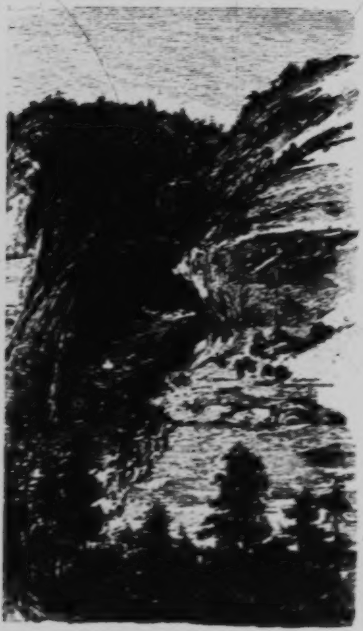
The ornamentation of the walls is another evidence of the superiority of the Cliff-Dwellers. All the explorers have spoken of this Colonel Simpson and Mr. Morgan speak of the rooms which were entirely of stone, but the arrangement of the stone in the walls so blended with the poles which formed the ceilings above, and the smooth floor below, as to make them attractive. Mr. W. H. Holmes and W. H. Jackson have also spoken of the wash of many colored plaster which was frequently applied to the rooms. Mr. F. H. Chapin has spoken of the peculiar decoration of the walls and has given a photograph of a room in "Cliff Palace" and of another in "Spruce Tree House." He says:

> Much care was used in finishing the walls, little holes were filled with small stones or chinked with fragments of decorated pottery and painted ware. Some of the walls were decorated with lines and broad bands similar to embellishments on the pottery. In "Cliff Palace," a broad band had been painted across the walls, and above it is a peculiar decoration which is shown in the illustration. The lines were similar to the enbellishment on the pottery which we found. The walls of the "Spruce Tree House," were also decorated with lines similar to those described as existing in the "Cliff Palace." One of more interest, is the picture of two turkeys fighting.

Mr. Mendeliff also speaks of the decoration of the walls of the estufas found in the Cañon de Chelly. He says: "Some of the kivas have interior decorations consisting of bands with points. The band done in white is 18 inches below the bench and its top is broken at intervals with points. In the principal kivas in 'Mummy Cave' there is a painted band four or five inches wide, consisting of a meander done in red over a white back ground, arranged in squares. Examples almost identical with those shown here are found in the Mancos ruins. It is probable that they are of a ceremonial rather than of a decorative origin"

DECORATED WALL IN CLIFF PALACE.

The similarity of these decorations to those which are found upon the pottery of the most ancient kind, viz: that which is decorated in black and white, show that these cliff-dwellings were ancient, notwithstanding the fact that they appear so modern in their style and finish. It is universally admitted that there was a decline in the artistic taste and mechanical skill of the Cliff-Dwellers before they reached their final home in the pueblos, especially those of the Moquis and Zunis. While they are constructed in the same general style and are very massive, yet they lack the peculiar elements of taste which were embodied in the walls and rooms of the buildings now in ruins.



CLIFF-DWELLING IN MUMMY CAVE.

IV. The number and arrangement of the rooms are to be studied in connection with the village and domestic life. The number varies according to locality, for some of the cliff-villages, such as the one called "Cliff Palace," has as many as one hundred rooms, others, of which Monarch's Cave is a specimen, have only ten or twelve, Still every cliff-village, whether large or small, had the same elements. As to the arrangement of the apartments, there was also a great variation. There were a few cliff-villages in which the apartments were separated from one another by a tower which stood in the centre, the dwellings being placed in the cove of the rocks on either side. The village called Mummy Cave, in Cañon de Chelly described by Mr. Mendeliff, has this peculiarity. There was an eastern and a western cove; fifty-five rooms in the eastern and twenty in the western, and on the intermediate ledge were seven rooms which were exceptionally large and were constructed, all of them two stories high, and one of them three stories, which gave it the appearance of a tower. The rooms in Casa Blanca, or "White House," were arranged in two separate clusters. One cluster on the bottom land against the vertical cliff; the other on the ledge directly above, separated from the lower portion by some thirty-five feet of vertical cliff. There is evidence that some of the houses of the lower settlement were four stories high, and in fact reached up to the ledge, making the structures practically continuous. The lower ruin comprised about sixty rooms; which were situated but a few feet from the bottom land and covered an area of about 50x150 feet, The upper part contained about twenty rooms, arranged about the principal one, which was situated in the centre of the cave, the exterior of it finished by a coat of whitewash with a decorative band in yellow, hence the name Casa Blanca, "or White House." The walls of this room are two feet thick, twelve feet high in front, and seven feet high on the sides and inside. A small room at the eastern end of the cave was constructed partly of adobe and partly of stone, and it was probably only used for storage. In the western end of the cave there was another single room eleven feet high outside, the lower portion of stone, the upper part of adobe with buttresses[*] constructed of stone. Near the centre of the main room is a well finished doorway, which originally was a double notched or T shaped door, which in later periods was filled up so as to leave a rectangular door. In the southeast corner of the second room from the east there is an opening in the front wall which may have been a drain. This would imply that the rooms were not roofed, although the cliff above is probably 500 feet high and overhangs so that a perpendicular line would fall 70 feet beyond the foot of the cliff, and 15 feet beyond the outermost walls, still a driving storm of rain or snow would leave a considerable quantity of water in the front rooms, if not roofed, and some means would have to be provided to carry it off. In the fourth room from the east there are remains of a chimney like structure—the only one in the upper ruin.

CANYON DEL MUERTO.

Nordenskjold says: "In the 'Spruce Tree House' there was a division of the village into two parts, which were separated by an open passage-way which runs back through the whole ruin.[†] . Each part contained an open space or court. There was a spring below 'Spruce Tree House.' Back of the court there were bird droppings of tame turkeys. A tower four stories high gave admirable evidence of the great skill of the builders, especially when we remember the rude implements with which they did their work."

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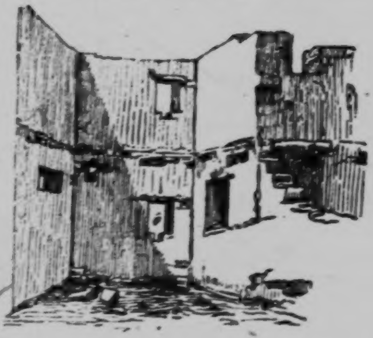
[*] A buttress is an anomolous feature which Mr. Mendeliff says is difficult to believe of aboriginal conception; still buttresses are seen in many places.

[†] This shows that the village was divided into phratries.

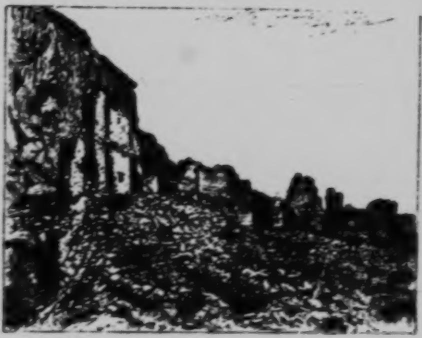
This separation of the villages into two parts may have been owing to the division of the cliff into two coves; yet it furnishes a hint as to possible differences in the social organization of the Cliff-Dwellers in the Mancos Canyon and the Canyon de Chelly. In the first, Mancos and Cliff canyons, the houses are continuous and the tower is at one side; while in the latter, the Canyon de Chelly, the tower is in the center and the houses at either side, thus indicating that the cacique, or village governor, was the most prominent in one, and the war captain in the other. The evidence that there were phratries among the Cliff-Dwellers is furnished by the fact that the ruins of two separate pueblos were discovered by Mr. Morgan on the Animas, and by the fact that Nordenskjold noticed the open passage-way between the two sets of rooms and courts in the "Spruce Tree House." It is plain that these Cliff-Dwellings in both localities were FORTIFIED VILLAGES, or pueblos, and were permanently occupied, notwithstanding the fact that Mr. Mendeliff thinks them to have been either "temporary resorts" or "built at a modern date."

WHITE HOUSE IN THE CANYON DE CHELLY.

V. The architectural contrivances which brought domestic conveniences to the people are very suggestive. These contrivances were very similar to those which are common in modern times and are in great contrast to anything seen among the rude Indian tribes. (1) In the first place, the building of a stone house with two, three and four stories, would be a strange thing for ordinary Indians to do. The Cliff-Dwellers not only built such houses, but they placed them high up in the sides of the cliff, carrying the food on which they were to subsist up the steep paths, and depositing it in the store-houses which were built in the niches of the rocks. The cut given herewith shows a house, two stories high, which was placed on a ledge 1,000 feet above the valley. It looks like a modern house, for it is furnished with floors, windows, doors, and rectangular rooms which are plastered and whitewashed. Just outside of the rooms was a reservoir or tank designed to contain water, which was reached by climbing down the sides of the house by the aid of pegs in the walls, while in front of the house were buttresses which supported a balcony or front porch. This resembles the houses which are now in ruins but which formerly stood in the valley of the Chaco many miles to the south, but with this essential difference, that there were only three rooms in this house, while in the house on the Chaco, there were some three hundred; yet the rooms in the small house were finished in the same style and had the same appearance as those in the great house. (2) The stairways which led to cliff-dwellings are especially worthy of notice. There are stairways to the modern pueblos of the Tusayans and Zunis which are not as well made as these. Some have imagined that the style of building houses with stairways and stone buttresses, and drains, is proof that the cliff-dwellings were built after the advent of the white man; but



RUINED CLIFF-HOUSE IN THE MANCOS CANYON.*



RUINED HOUSE IN CHACO CANYON.

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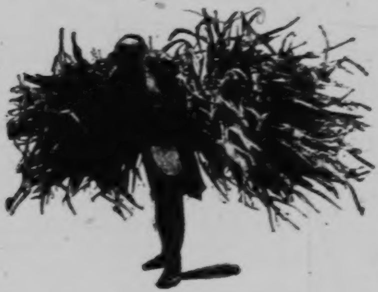
*This Cliff House was situated nearly 1,000 feet above the valley and was discovered by Mr. Jackson; the room represented in the other cut was an apartment in one of the pueblos which Colonel Simpson discovered in the Chaco canyon. The solitary house is suggestive of the scattered condition into which the ancient Pueblo tribes were thrown by the constant attack of their enemies, and yet the finish of these walls and apartments show the advanced condition of the people in the prehistoric times.

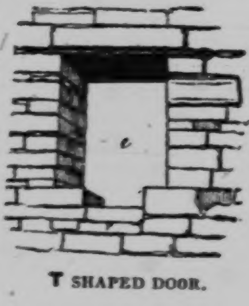
here are the ruins of buildings, one of which was erected high up in the cliff on the Mancos and the other in the valley of the Chaco,[*] which have doorways, plastered walls, buttresses, windows, and double stories, and even "cornices" resembling those in modern houses, and we conclude that if any buildings were erected in prehistoric times these must have been. They show the conveniences to which the people were accustomed,—even carrying the material to the cliffs and with infinite pains perpetuating them in the houses built there. (3). Another contrivance which illustrates the domestic life was the balcony. There were balconies in nearly all of the cliff-houses. They projected out in front above the first story and below the doors of the second story and overlooked the valleys, and were probably used as the platforms and roofs were, as the loitering places where the housewives spent much of their time. In some cases the balconies formed outside passage-ways between the rooms of the upper stories, as may be seen in the "Balcony House." (4) The arrangement of the doors and windows was another convenience which shows much skill and forethought. There were not only doors which gave access to the different rooms and from the rooms to the courts, but there were windows which gave a view of the scenery outside, thus making the home attractive as well as safe. This was the case even in the cave dwellings.



INDIAN CORN CARRIER.[†]

Mr. W. H. Jackson in speaking of Echo cave, which is situated twelve miles below Montezuma, says:

> Window-like apertures afforded communication between each room all through the second story. There was also one window in each lower room about twelve inches square looking out toward the open country.



T SHAPED DOOR.

These windows, doors, balconies and roofs gave extensive views of the valleys, and the fact that they were so common, shows that the Clift-Dwellers were lovers of scenery and enjoyed looking out upon it. (5) There were contrivances for weaving, cooking, and making pottery which show their industry and skill. Mr. Jackson describes some of these. He says of Echo Cave:

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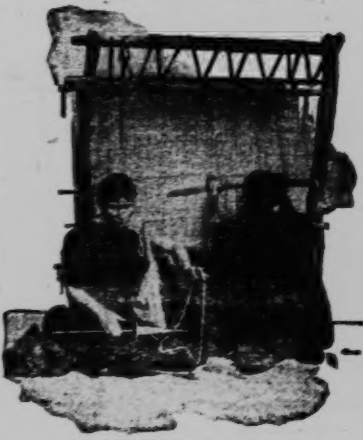
[*] A room decorated in Chaco canyon was not plastered, but was finished with thick and thin stones in alternate rows. The poles which formed the ceiling and the floor gave to it a very neat appearance. There was a window on either side of this room, and a door at one end. The plate illustrates this manner of finishing the room.

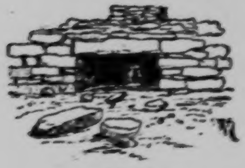
[†] These cuts, one of which has been kindly loaned us by the National Museum and the other by the Santa Fe R. R., illustrates the manner of carrying the corn on the shoulder, supported by a band around the head, and the adaptation of the doors to receive them. Many woven bands have been discovered among the cliff-dwellings. The custom of weaving the bands and of carrying the corn in this way still continues, both among the Navajos and the Zunis.

> In the central room of the main building we found a circular basin-like depression, thirty inches across and and ten inches deep, that had served as a fireplace, being still filled with the ashes and cinders of aboriginal fires, the surrounding walls being blackened with smoke and soot. This room was undoubtedly the kitchen of the house. Some of the smaller rooms seem to have been used for the same purpose, the fires having been made in a corner against the back wall, the smoke escaping overhead. The masonry displayed in the construction of the walls is very creditable; a symmetrical curve is preserved throughout the whole line and every portion is perfectly plumb. The sub-divisions are at right-angles to the front. In the rear was an open space eleven feet wide and nine deep, which probably served as a "work-shop." Four holes were drilled into the smooth rock floor, about six feet equidistantly apart, each from six to ten inches deep, and five inches in diameter, as perfectly round as though drilled by machinery. We can reasonably assume that these people were familiar with the art of weaving, and that it was here they worked at the loom, the drilled holes supporting the posts. In this open space are a number of grooves worn into the rock in various places, caused by the artificers of the little town in sharpening and polishing their stone implements.*



WOMEN WEAVING.

(6) The fireplaces are to be noticed. One kind of a fireplace is described by Mr. Jackson, and a cut is given of it; another kind is described by Mr. F. H. Chapin. It consists in placing a stone fender across one corner of the room. This shows that the people provided for their own comfort during the cold weather and lived comparatively secure, even amidst the cliffs. (7) The pottery and pottery-kilns which have been described, also show their artistic taste and skill. Pottery vessels have been discovered in many houses. Furnaces used for firing pottery have been found in the cliff-dwellings on the Rio Mancos and on the Rio Verde. One, having walls standing to the height of fifteen or twenty feet and perfectly preserved, was found by Dr. Mearns at Oak Creek.



FIREPLACE.

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*See Hayden's Geographical Survey of the Territories: Washington, D.C.; 1876, page 32.

Large pits were seen in the vicinity from which the material was taken. (8) The mills, axes and tools are worthy of notice. Metates, or large stone mortars or mills, were discovered by Dr. Mearns,—some of them with the cylindrical stone which was used for grinding inside of the mills. He says:*

> A series of these primitive stone mills may be seen in the American Museum. Grooved stone axes and hatchets were numerous, and likewise exhibit an unusually wide range of variation in size, shade, material and workmanship. Several of them are in form and finish, scarcely inferior to the modern articles. Some of the picks and hammers were also models of the handicraft of the stone age. Not the least interesting were the stone wedges (doubtless intended for splitting timbers) and agricultural tools. There was also a large assortment of stone knives, resembling in shape the chopping-knife of modern housewives. Heavy mauls, pipes of lava, whetstones, polishing-stones, and other implements whose use is not apparent, were obtained, besides mortars and pestles, stone vessels, and plates or platters of volcanic rock. Besides such articles of domestic use, there were the implements of warfare and of chase, including rounded stone hammers, mostly of sandstone and scoria, grooved for attachment to a handle by means of a hide thong; also grooved stones used in arrow-making, spear-heads and arrow points of obsidian or agate, and flints from the war club. Pigments—red, blue, gray, and black—were found; also a heavy, black powder, and the usual chipped pieces of obsidian (volcanic glass) and agate, together with ornamental pebbles, etc. Nor were ornaments lacking such as amulets of shells and rings of bone and shells. Large earthen vessels were uncovered, the largest of them had a capacity of thirty gallons. One room appeared to have served as a store-room for earthen utensils, some of which were found in nests contained one within another, the smallest specimen measuring but $1\frac{1}{4}$ inches in diameter. There were ladles, dippers, shallow saucers, graceful ollas and vases which displayed much artistic feeling in their conception and execution. . . . Numerous tools of bone, such as were employed in the manufacture of rope, neatly carved from the bones of deer or antelope, were among the relics found. Various food substances were examined, including bones, teeth or horns (usually charred by fire) of elk, mule-deer, antelope, beaver, spermophile, pouched gopher, wood-rat, muskrat, mice, cotton- and jack rabbit, turkey, serpent, turtle and fish. A sandal of yucca, differing in design from that taken from the wall of Montezuma's Castle, and several pieces of human scalps, complete the list of relics from this casa.

VI. Here then we have the archæological evidence of the domestic life of the Cliff-Dwellers, both those who were situated in the Mancos canyon, in the Canyon de Chelly and on the Rio Verde. The best illustration, however, is that which is given by the people who still inhabit the pueblos, and who are supposed to be the same people who formerly spread over the entire plateau and some of whom built the cliff-dwellings as a defense against the wild tribes. Their domestic life, though somewhat modified by contact with the whites, undoubtedly resembles that of the Cliff-Dwellers, for they are very tenacious of their old customs and ways, and still continue the same organization and peculiar pueblo life.

The following description was furnished by a lady who became thoroughly familiar with it on accompanying her husband, who was in charge of the field parties under Major

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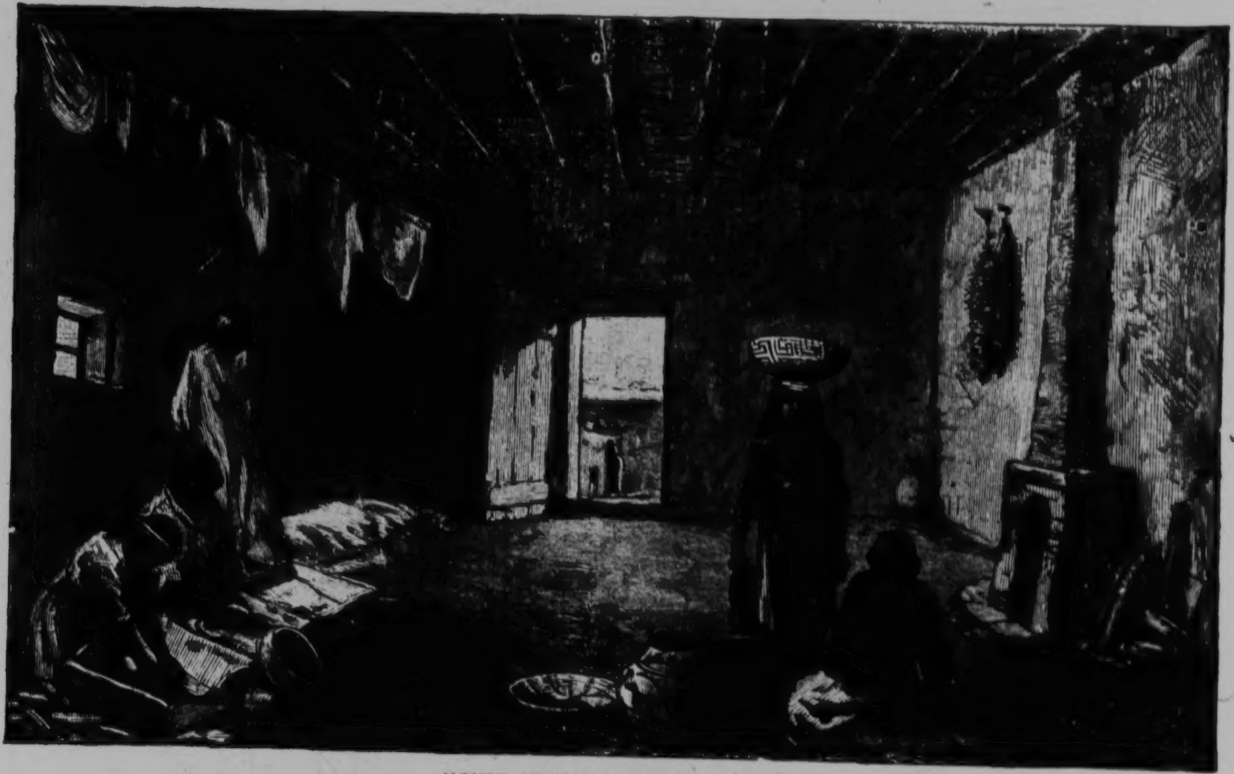
*Popular Science Monthly, October 20th, 1890, pp. 761-62.



HOUSE INTERIOR OF THE ZUNIS.

—From *Grand Canyon of the Colorado*, Flood & Vincent, Publishers.

Powell, Mrs. James Stevenson. She made an extensive visit to Zuni and says :

Their extreme exclusiveness has preserved to the Zunians their strong individuality, and kept their language pure. According to Major Powell's classification, their speech forms one of the four linguistic stocks to which may be traced all the Pueblo dialects of the southwest. In all the large area which was once thickly dotted with settlements, only thirty-one remain, and these are scattered hundreds of miles apart from Taos, in northern New Mexico, to Isleta, in western Texas. Among these remnants of great native tribes, the Zunians may claim perhaps the highest position, whether we regard simply their agricultural and pastoral pursuits, or consider their whole social and political organization.

The town of Zuni is built in the most curious style. It resembles a great bee hive, with the houses piled one upon another in a succession of terraces, the roof of one forming the floor or yard of the next above, and so on, until in some cases five tiers of dwellings are successively erected though no one of them is over two stories high. These structures are of stone and 'adobe.' They are clustered around two plazas, or open squares, with several streets and three covered ways through the town. The upper houses of Zuni are reached by ladders from the outside. The lower tiers have doors on the ground plan, while the entrances to the others are from the terraces. There is a second entrance through hatchways in the roof, and thence by ladders down into the rooms below. In times of threatened attack the ladders were either drawn up or their rungs were removed, and the lower doors were securely fastened in some of the many ingenious ways these people have of barring the entrances to their dwellings. The houses have small windows in which mica was originally used, and is still employed to some extent; but the Zunians prize glass highly, and secure it whenever practicable, at almost any cost. A dwelling of average capacity has four or five rooms, though in some there are as many as eight. Some of the larger apartments are paved with flagging, but the floors are usually plastered with clay, like the walls. They are kept in constant repair by the women, who mix a reddish-brown earth with water to the proper consistency, and then spreading it by hand, always laying it on in semi-circles. It dries smooth and even, and looks well. In working this plaster the squaw keeps her mouth filled with water, which is applied with all the dexterity with which a Chinese laundryman sprinkles clothes. The women appear to delight in this work, which they consider their special prerogative, and would feel that their rights were infringed upon were man to do it. In building, the men lay the stone foundations and set in place the huge logs that serve as beams to support the roof, the spaces between these

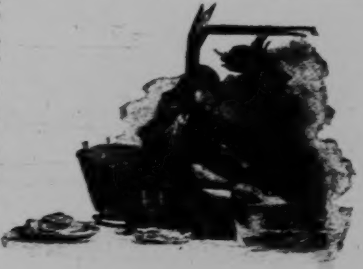
GRINDING MEAL.

rafters being filled with willow brush; though some of the wealthier Zunians use instead shingles made by the carpenters of the village. The women then finish the structure. The ceilings of all the older houses are low; but Zuni architecture has improved and the modern style gives plenty of room, with doors through which one may pass without stooping. The inner walls are usually whitened. For this purpose a kind of white clay is dissolved in boiling water and applied by hand. A glove of undressed goat skin is worn, the hand being dipped in the hot liquid and passed repeatedly over the wall.

In Zuni, as elsewhere, riches and official position confer importance upon possessors. The wealthier class live in the lower houses, those of moderate means next above, while the poorer families have to be content with the uppermost stories. Naturally nobody will climb into the garret who has the means of securing more convenient apartments, under the huge system of "French Flats," which is the way of living in Zuni.

The Alcalde, or lieutenant-governor, furnishes an exception to the general rule, as his official duties require him to occupy the highest house of all, from the top of which he announces each morning to the people the orders of the governor, and makes such other proclamations as may be required of him.

Each family has one room, generally the largest in the house, where they eat, work and sleep together. In this room the wardrobe of the family hangs upon a log suspended beneath the rafters. Only the more valued robes, such as those worn in the dance, being wrapped and carefully stored away in another apartment. Work of all kinds goes on in this larger room, including the cooking, which is done in a fireplace on the long side, made by a projection at right angles with the wall, with a mantel-piece on which rests the base of the chimney. Another fireplace in another place is from six to eight feet in width, and above this is a ledge shaped chimney like a Chinese awning. A highly-polished slab, fifteen or twenty inches in size, is raised a foot above the hearth. Coals are heaped beneath this slab, and upon it the Waiavi is baked. This delicious kind of bread is made of meal ground finely and spread in a thin batter upon the stone with the naked hand. It is as thin as a wafer, and these crisp, gauzy sheets when cooked are piled in layers and then folded or rolled. Light bread, which is made only at feast times, is baked in adobe ovens outside of the houses. When not in use for this purpose they make convenient kennels for the dogs, and playhouses for the children. Neatness is not one of the characteristics of the Zunians. In the late autumn and winter the women do little else than make bread; often in fanciful shapes for the feasts and dances which continually occur. A sweet drink, not at all intoxicating, is made from the sprouted wheat. The men use tobacco, procured from white traders, in the form of cigarettes from corn-husks; but this is a luxury in which the women do not indulge. The Pueblo mills are among the most interesting things about the town. These mills, which are fastened to the floor a few feet from the wall, are rectangular in shape, and divided into a number of compartments, each about twenty inches wide and deep, the whole series ranging from five to ten feet in length, according to the number of divisions. The walls are made of sand-stone. In each compartment a flat grinding stone is firmly set, inclining at an angle of forty-five degrees. These slabs are of different degrees of smoothness graduated successively from coarse to fine. The squaws, who alone work at the mills, kneel before them and bend over them as a laundress does over the wash-tub, holding in their hands long stones of volcanic lava,



MAKING BREAD.

which they rub up and down the slanting slabs, stopping at intervals to place the grain between the stones. As the grinding proceeds the grist is passed from one compartment to the next until, in passing through the series, it becomes of the desired fineness. This tedious and laborious method has been practiced without improvement from time immemorial, and in some of the arts the Zunians have actually retrograded.

The Spanish account is earlier and better, and we shall therefore close with quoting from Mendoza, who says:

> Most of the houses are reached from the flat roof, using their ladders to go to the streets. The stories are mostly half as high again as a man, except the first one which is low and little more than a man's height. One ladder is used to communicate with ten or twelve houses together. They make use of the low ones and live in the highest ones; in the lowest ones of all they have loop-holes made sideways as in the fortresses of Spain. The Indians say that when the people are attacked they station themselves in their houses and fight from there. When they go to war they carry shields and wear leather jackets which are made of cow's hide colored, and they fight with arrows and with a sort of stone maul, and with some other weapons made of sticks. They eat human flesh and keep those whom they capture in war as slaves. In their houses they keep hairy animals (vicunas?) like the large Spanish hounds, which they shear, and they make long colored wigs from the hair, which they wear, and they also put the same stuff in the cloth which they make. The men are of small stature; the women are light-colored and of good appearance and they wear chemises which reach down to their feet; they wear their hair on each side, done up in a sort of twist, which leaves their ears outside, in which hang many turquoises as well as on their neck and arms. The clothing of the men is a cloak; and over this the skin of a cow; they wear caps on their heads; in summer they wear shoes made of painted or colored skin, and high buskins in winter. They cultivate the ground the same way as in New Spain. They carry things on their heads as in Mexico. The men weave cloth and spin cotton; they have salt from the marshy lake which is two days from Cibola. The Indians have their dances and songs with some flutes, which have holes on which to put the fingers; they make much noise; they sing in unison with those who play, and those who sing clap their hands in our fashion. They say that five or six play together, and that some of the flutes are better than others. . . . The food which they eat in this country is corn, of which they have a great abundance, and beans and venison, which they probably eat (although they say that they do not), because we found many skins of deer and hares and rabbits. They make the best corn cakes I have ever seen anywhere, and this is what everybody ordinarily eats. They have the very best arrangement and machinery for grinding that was ever seen. One of these Indian women here will grind as much as four of the Mexicans. . . . . I send you a cow skin, some turquoises, and two earrings of the same, and fifteen of the Indian combs, and some plates decorated with these turquoises, and two baskets made of wicker, of which the Indians have a large supply. I also send two rolls, such as the women usually wear on their heads when they bring water from the spring, the same way they do in Spain. These Indian women, with one of these rolls on her head, will carry a jar of water up a ladder without touching it with her hands. And, lastly, I send you samples of the weapons with which the natives fight, a shield, a hammer, and a bow and some arrows, among which there are two with bone points, the like of which have never been seen.

# CHAPTER XV.

## RELICS OF THE CLIFF-DWELLERS.

In treating of the Cliff-Dwellers, we have thus far given much more attention to the architectural structures than we have to their relics, for we find in them distinguishing traits, which enable us to identify the culture, progress and history of this peculiar people. There are, however, some advantages in studying the relics of the Cliff-Dwellers and making them a source of information, about their history and social status; the chief of which is that the relics are now gathered into museums and subjected to the inspection of all the visitors, and so presented to the public that specialists have an opportunity of studying them at their leisure.

Great care will, however, be necessary to distinguish these relics from those of the wild tribes who have continued to dwell in that vicinity since the departure of the Cliff-Dwellers, and who have left their relics mingled near the ancient habitations, and sometimes in the very midst of the ruins. This is not always easy to do, for there is far more similarity between the relics of the two classes of people, than between the structures; the structures having been made of entirely different material,—wood and bark used by the wild tribes, but stone and adobe by the Cliff-Dwellers; while the relics of the wild tribes and Cliff-Dwellers were made of all kinds of materials--wood, stone, shells, bones and pottery, and it is difficult to distinguish between those of one class and those of another. It is hardly expected that the ordinary observer will be able to distinguish between these relics as they are gathered into museums and collections, and say which belonged to the wild hunters, who have continued to roam in the same region, and which to the Cliff-Dwellers, nor can it be expected that he will be able to distinguish between the pottery and other relics of modern Pueblos and the ancient people; yet it is important that this should be done, for by this means, do we determine the difference between the condition of the later and that of the earlier and less known people.

We may say that the early explorers who visited the pueblos, and especially those who went into the midst of the cliff dwellings, were more careful than some of the later explorers and relic hunters, and were able not only to distinguish between the two classes—the ancient and modern,—but also able to point out the tribal distinctions by examination of the weapons, implements, peculiarities of dress and ornaments, and say whether they belonged to Utes, Navajos, Mojaves, Pimás, Papagoes, or other tribes which roamed through the region after the American explorations began.

It is not expected that any ordinary white man will be as discriminating as the aborigines are themselves, for this would require almost a life-time of familiarity with the relics and long training, for which few have the opportunity. Still, it is the work of the archæologist to approximate this skill and learn to distinguish the relics which belong to the different tribes, whether found in the fields or gathered in the museums, and recognize the tribal lines and different periods represented by the specimens. Mr. Barber says:

> Each distinct Indian tribe possesses its individual characteristics and peculiarities, different from all others; and, although neighboring tribes may resemble each other in certain mutual, well-established customs, there are always minor points of difference in language, habits, the forms of warfare, or peculiarities of dress; and by these points an individual Indian may be recognized as belonging to a certain tribe, even should the observer be not sufficiently familiar with the savage physiognomy to class him by his facial characteristics. Among themselves, Indians possess a remarkable degree of discernment, being able to detect the most minute shades of difference in well-known objects, so that one can determine unerringly to what tribe another may have belonged, from the sight of a single impression of a moccasined foot in the soil. So great is their acuteness of vision and proficiency in the interpretation of signs, that they readily distinguish objects and their kind at a great distance, when unaccustomed eyes can discover nothing. To the eye of the unexperienced in such matters, a stone arrow head, in whatever section of the West it may have been picked up, would present the appearance simply of an Indian relic; but when exposed to the gaze of a warrior, it is immediately recognized as having been used by a certain tribe. This is more wonderful for the reason that stone weapons have entirely disappeared from among them, The stone heads, which were, perhaps, fashioned more than half a century ago, being now replaced by iron-pointed arrows, fastened on the wooden shaft.*

To these explorers great credit is due, not only on this account, but because they carried on their explorations under great difficulties and amid danger of attacks from the wild tribes of savages. It is, however, worthy of notice that very few of these early explorers spent any time in digging for relics, and their finds were such as could easily be gathered from the midst of the cliff dwellings, while some of the later explorers spent more time in this way, and were able to bring away large and valuable collections.

In giving the description of the Cliff-Dwellers' relics, we shall refer to these explorers and rely upon their testimony, especially that which relates to the difference between the relics of the Cliff-Dwellers and those of the wild tribes, and between the relics of the ancient Cliff-Dwellers and the modern Pueblos, and so make a double line of comparison. We shall first take the different districts which were occupied by the Cliff-Dwellers and notice the localities from which the relics were gathered, and learn from them about their distribution. We shall next consider the characteristics of the relics which were found in these districts, and compare them with those which belong to the Pueblos, and notice the changes which

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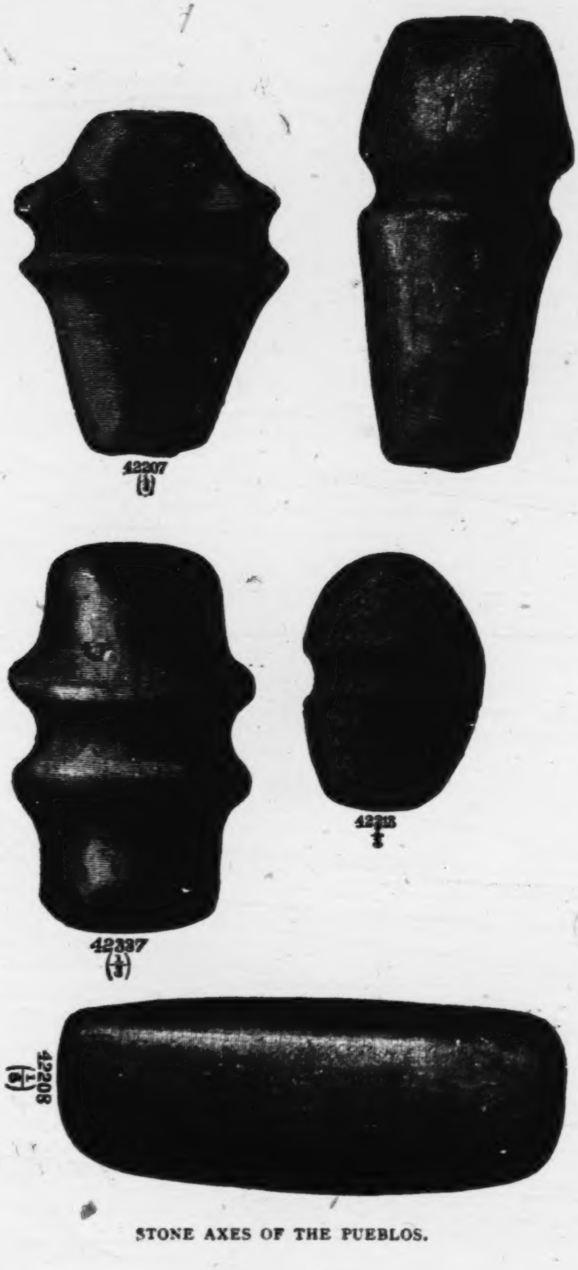
*"Language and Utensils of the Modern Utes," by E. A. Barber.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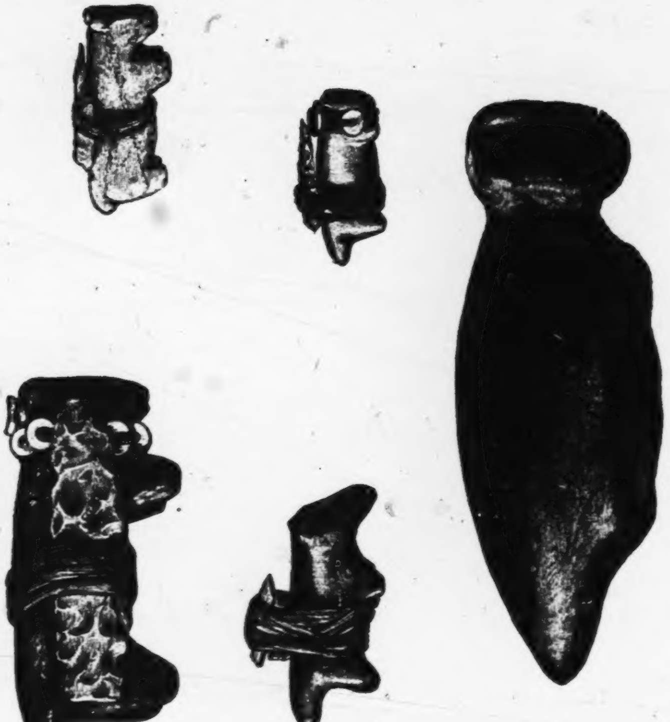
STONE AXES OF THE PUEBLOS.



STONE FETICHES OF THE PUEBLOS.

have appeared in them. We shall, in the last place, take the relics which belong to different regions, and which indicate different periods of occupation, and so find out the changes which occurred in the history of the Cliff-Dwellers themselves and recognize the different grades of culture which are manifest in the relics.

I. We shall first speak of the distribution of the Cliff-Dwellers' relics. There are several distinct districts which may be ascribed to the Cliff-Dwellers, and from which Cliff-Dwellers' relics have been gathered. These districts may be classified in the order of their discovery, as follows:

(1) Those situated along the San Juan, especially in the Mancos Cañon; (2) those on the Rio de Chelley; (3) those on the Rio Verde. To these should be added the relics from different districts where pueblos are situated, viz.: (4) The pueblos of the Tusayans; (5) the Zuni pueblo, including Acoma; (6) the pueblos on the Rio Grande from Taos to Socorro; (7) the cave dwellings in Potreros west of the Rio Grande, near Cochiti; (8) the region along the Gila and the valley of the Sonora. The relics from these different districts taken together, form a most unique and interesting series, and one worthy of study, for they indicate a condition of society and stage of art which is peculiar and which is found nowhere else.[*]

The number of relics which have been gathered is astonishing. Nearly all the museums of this country abound with large collections, and yet the supply is by no means exhausted, for new localities are being constantly visited and the old and ruined pueblos are yielding new and interesting supplies.

The cliff dwellings proper are all situated on the northern and western borders of the Pueblo region, but they are so near, that the relics gathered from them seem to partake of the same characteristics, though the ancient specimens shade into the modern, so that it is difficult to distinguish between the two. It is, however, the testimony of all that the corrugated and black and white ware are found in the caves and cliff dwellings and in the ruined pueblos, and indicate that a population once spread over the entire region, which used this kind of pottery almost exclusively. Much of the decorated pottery is of a later origin.

1. We shall begin with the relics which were discovered in the vicinity of the San Juan and its tributaries, and especially those which were found in the Mancos Cañon. Various parties have entered this region and gathered relics from the cliff dwellings. Among these, we may mention first, the gentlemen who accompanied the Hayden survey in 1874 and 1876, viz.: Mr. W. H. Jackson, Mr. W. H. Holmes and Mr. E. A. Barber;[†]

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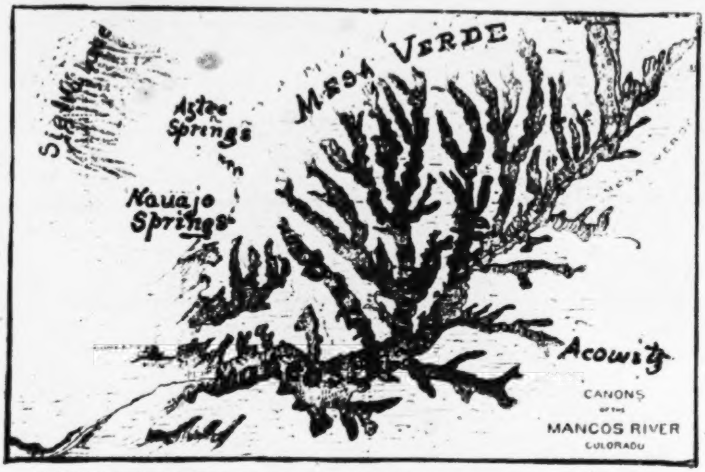
[*] This division of the territory from which relics have been gathered is about the same as that laid down in the map, as indicating the different clusters or groups of cliff dwellings and pueblos, though there is no attempt to indicate the tribal lines.

[†] Their reports are attended with various cuts which give an idea of the stone relics, pottery and its decorations. We take pleasure in referring to these cuts.

next Mr. F. H. Chapin, of Hartford, and Dr. Birdsall, of New York City, who between 1890 and 1893 explored the ruins in Mancos Cañon, and who published descriptions of the relics and the cliff dwellings in various publications, among which, the chief was THE AMERICAN ANTIQUARIAN. Mr. Chapin also published a book called, "The Land of the Cliff-Dwellers." This contains a map of the Mesa Verde region,* with the cañons plainly marked upon it; also, a large number of photographic views of the cliff dwellings and their relics. The next to enter the field was Mr. Nordenskjold, who spent considerable time measuring and surveying the cliff-dwellings and excavating for relics, and who afterwards published in Stockholm, Sweden, a magnificent work, in quarto form, which was written in English and Swedish and contained many photographic plates. The other parties in the field about the same time, who were collecting relics for exhibition at the World's Fair, spent their time mainly in a general ransacking of the region for relics, and made no note of the particular locality from which they were taken. These collections are not without value, for they contain many rare specimens of decorated pottery, also, many wooden implements, specimens of textile fabrics, a large number of stone relics, many mummied skeletons, which showed the physical characteristics of the Cliff-Dwellers themselves. Their collections were valuable in awakening attention to the Cliff-Dwellers, and giving many



REGION WHERE THE CLIFF DWELLINGS WERE FIRST DISCOVERED.

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* This map shows the location of the ruins of Aztec Springs, described by Holmes, Jackson and Barber; also of the Cliff House described by Nordenskjold; also of the Sandal Cliff House in Azcowitz Canyon, near which the Wetherells gathered so many relics.

new ideas to the specialist; but they can not be relied upon, inasmuch as they were not accompanied with any definite descriptions, and the localities of the finds still remain uncertain.

It was through the unscientific collectors that certain relics which evidently belong to Ute Indians, and consist of rude willow cradles and wooden slings with cotton cord attached to them, have found their way into museums and are placed alongside of Cliff-Dwellers' relics, because they were gathered from near cliff dwellings. We may say, however, that the relics which were gathered by the Wetherell Brothers, and which were placed in the museum in Denver, were much more carefully exhumed, and, perhaps, can be pronounced as genuine Cliff-Dwellers' relics.

The following is the description of them by Mr. F. H. Chapin. He says:

> They commenced their excavations in the first cliff house in Mancos Canyon, called "Sandal Cliff House." They followed up the digging, and were very successful. They discovered one hundred sandals, some in good condition, others old and worn out; a string of beads; a pitcher full of squash seeds, and a jug with pieces of string passing through the handles. This jug was filled with corn, well shelled, with the exception of two ears. They excavated a perfect skeleton, with even some of the toe nails remaining; it had been buried with care in a grave, two and one-half feet wide, six feet long and twenty inches deep. A stone wall was upon one side, and the bottom of the grave was finished with smooth clay. The body lay with the head to the south, and face to the west. It was wrapped in a feather cloth, and then laid in matting. Buried with it was a broken jar, a very small unburned cup, a piece of string made from hair, and one wooden needle.
>
> Next to the wall mentioned above, was found the body of an infant, which was dried and well preserved, like a mummy. It was wrapped in thin cloth, that was once feather cloth, and encasing all was willow matting, tied securely with yucca strings.*

2. The relics which were gathered from the Rio de Chelley are next to be considered. This region was visited successively by General Simpson in 1849, Mr. W. H. Jackson in 1876, Mr. F. T. Bickford in 1890, and Mr. Cosmos Mindeleff in 1895. The cliff dwellings were measured and the relics described. The Navajos were the occupants of the region, but they dwell in hogans or huts. They were formerly hunters, but are now shepherds. They have no permanent villages, though they cultivate the soil in the valleys during the summer, and during the winter make their homes in the mountains. They are known as a strong, athletic and finely-formed tribe, and are distinguished for their skill in blanket weaving and in the manufacture of metal relics, and especially for their wonderful sand paintings. Their pottery is of an inferior character, and their relics, though superior to those of the Utes, are not as varied or as well wrought as those of the Cliff-Dwellers, who preceded them. It is comparatively easy to draw the line between the two classes, for the earlier people were agriculturists and led a sedentary life, and their pottery and relics were such as the agri-

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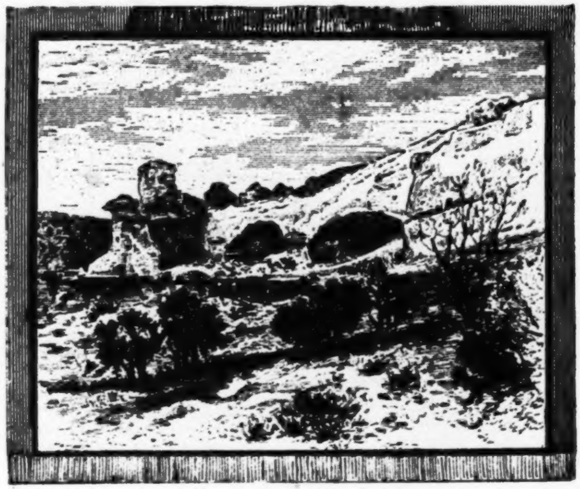
*"The Land of the Cliff-Dwellers," by F. H. Chapin; page 160.

cultural people of the entire region were accustomed to use. The distinction between the two classes of people may also be recognized in the traditions which are still extant.

The Navajos have a very remarkable myth or tradition, called the "Mountain Chant," which describes the introduction of sand painting. It contains a description of the adventures of a hunter, who was taken captive by a Ute; every part of the story has reference to tents of hunters and to the experiences which hunters have among the mountains, and the haunts of the animals, with which hunters become familiar. No such myth exists among the Pueblos, for all of their mythology is connected with the scenes of agriculture, and their ceremonies have reference to nature powers and the rain gods, rather than the mountain divinities. The relics and pottery ornaments contain symbols which illustrate the two classes of myths.



PUEBLO AT EPSOM CREEK.

3. The cliff dwellings of the Rio Verde were first brought to light by the guide Leroux, who attended Colonel Ewbank in his explorations in 1849. They were afterwards visited by Dr. W. J. Hoffman in 1877, and Dr. Edgar A. Mearns in 1884 and 1890; and those at Red Bank not far from the Rio Verde were visited by Mr, J. Walter Fewkes in 1895.

It was in this vicinity that Dr. Hoffman discovered Montezuma Castle and the remarkable depression in the rocks which is called Montezuma Wells. In both of these localities the Cliff-Dwellers evidently made their homes, for there are many caves and ruined cliff dwellings, which indicate long periods of occupation. The especial attraction of the latter place was the bountiful supply of water from the so-called wells. The description by Dr. Hoffman is as follows:

> Montezuma Wells is so called from the fact that it is an oblong depression, about sixty or seventy feet deep, having perpendicular walls, at the bottom of which is a deep spring or clear water. The excavation is about 100 yards in its greatest diameter, and about sixty yards in its lesser. There is but one point from which a descent can be made, and which passage is guarded by small cliff dwellings. In the various depressions, these small habitations are located, giving the place a very singular appearance. From the base of the depression on the eastern side, there is a narrow and low tunnel, leading out to banks of Beaver Creek a distance of about sixty or eighty feet. The settlement within this natural enclosure was, no doubt, a retreat in times of danger, as the sloping surface receding from it is covered with ruins of former structures, over the remains of which, and throughout considerable surface beyond, the soil is covered with numerous fragments of beautifully glazed and incised pottery. Flint and carnelian flakes, weapons and other remains occur in considerable quantities. The land surrounding this locality is excellent for agricultural purposes, and it appears to have been at one time under cultivation. Wherever one turns, scattered pieces of pottery are visible; giving either proof of a very large settlement, or one that lasted for many years.

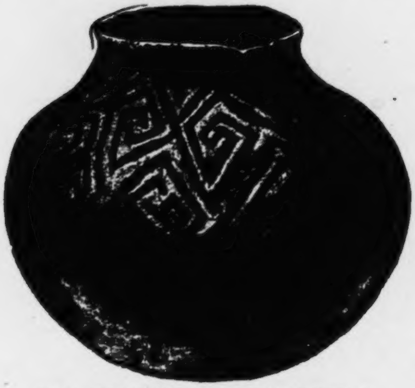
They were almost identical in form, style and material with those which Mr. Cushing obtained from the Casa Grande of the Salt River. There were certain relics which show that the social status was essentially the same. He says:

> The walled buildings are of two kinds—those occupying natural hollows or cavities, and those built in exposed situations. The former, whose walls are protected by sheltering cliffs, are sometimes found in almost as perfect a state of preservation as when deserted by the builders, unless the torch has been applied. The latter, of Pueblo style of architecture, usually occupying high points and commanding a wide extent of country, are in a ruined state, although the walls are commonly standing to the height of one or more stories, with some of the timbers intact.
>
> Another, and very common form of dwelling, is the caves, which are excavated in the cliffs by means of stone picks or other implements. They are found in all suitable localities that are contiguous to water and good agricultural land, but are most numerous in the vicinity of large casas grandes. Most of them are in limestone cliffs, as the substratum of sandstone is not as commonly exposed in the canyons and cliffs, but many cavate dwellings are in sandstone.
>
> The additional remains observed by me are mounds in the vicinity of ancient dwellings, extensive walls of stone and mortar, large quantities of stone implements and fragments of broken pottery, acequias or irrigating ditches, ancient burial grounds, and hieroglyphic inscriptions on stones and cliffs—the last two to be doubtfully referred to the cliff-dwellers.

4 and 5. The relics from the Tusayan Pueblos, as well as those from Zuni, have been described by nearly all the explorers, Colonel Simpson, W. H. Holmes, F. H. Cushing, James Stevenson, J. Walter Fewkes and others. Mr. Holmes has described those gathered from near St. George, Utah, nearly 300 miles west of the Rio Mancos. He says:

> The most notable collection of coiled ware ever yet made in any one locality is from a dwelling site tumulus, near this place. The shapes of the corrugated relics are of the simplest kinds. The prevailing forms

correspond very closely with the Cliff House specimen illustated in the cut. The region now inhabited by the Pubelo tribes, seems to have been a favorite residence of ancient people. Ruins and remains of ceramic art may be found at any time, and it is a common thing to find ancient vessels in the possession of Pueblo Indians. This is especially true of the Zunis and Moquis, from whom considerable collections have been obtained. It seems unaccountable that so large a number of ancient vessels should be preserved, but many have been picked up by the later Pueblo tribes and put away for special use, or, probably, as heirlooms. Besides the archaic white ware and its closely associated red ware; the Province of Tusayan furnishes two or three distinct varieties, which are apparently confined to limited districts. There are few better examples of the skill and good taste of the ancient potter than a bowl, the upper part of which is painted a bright red, bordered in black, with fine white stripes, a globular vase, with an ornamented surface, separated into two parts by vertical panels. A vessel, shown above, is from the Tusayan province. The whole decoration consists of interlinked meander united; not arranged in belts, but thrown together in a careless manner across the body of the vase. A superb vessel is a typical example of the work of the ancient potters of Cibola. In form it falls a little short of perfect symmetry. A similar vase from Zuni is illustrated in the catalogue. The ornament consists of three zones, a band of step figures about the neck, the handsome meander chain with twisted links upon the rounded collar, and a broad band of radiating meanders encircling the body.*



VASE FROM THE TUSAYAN PUEBLOS.

6 and 7. In reference to the relics from the Rio Grande, from the caves among the Potreros, and from the pueblos on the Chaco, Mr. A. F. Bandelier has furnished the most information. He says:

> The pottery is mostly evenly glazed. The potsherds are of the older kind—black with white decorated lines, and corrugated.
>
> There were three distinct epochs of occupation, the most recent of which was by the Queres. On the Rio Grande, in the vicinity of Bernalillo, the pottery is of the glazed type and with decorations; but the common cooking pottery—plain black—was also well represented. Much obsidian, moss agate, chips of flint and lava, broken metals, and a few bits of turquoise were the other objects lying on the surface. The pottery of the Chaco ruins decidedly of the ancient type, and no specimen of glazed ornamentation has been found in that vicinity. In the valley of San Mateo, the specimens of pottery were very remarkable.
>
> I was greatly surprised, however, at seeing the specimens of pottery which the excavations had yielded. I can safely assert that, in beauty and originality of decoration, they surpass anything which I have seen north, west and east of it in the Rio Grande valley and around the Salines. There

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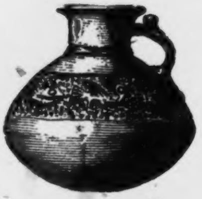
* "Fourth Annual Report Ethnological Bureau," pp. 333-345.

were among them bowls of indented pottery, one-half of their exterior being smooth and handsomely painted and decorated with combinations of the well-known symbols of Pueblo Indian worship. On another specimen, I noticed handles in the shape of animal heads. Such specimens are quite rare. The shape of the vessels did not differ from those which other ruins and even the Pueblos of to-day afford. It was only the decoration, and especially, the painting, that attracted my attention. Mr. Lummis speaks of other objects—shell beads, stone axes, hammers, metals and arrow heads.

8. As to the relics on the Gila, Mr. Bandelier says:

> The pottery on the upper Gila is like that which I found on the Rio Grande at San Diego. It is different from the pottery of the Salines, and has marked resemblance to potsherds from eastern Arizona and especially those from the Sierra Madre, Casa Grandes in Chihuahua, although better in material and more elaborately decorated with a greater variety of shades, the same fundamental patterns underlie the decorations, as in Utah, Colorado, New Mexico, and on the Rio Grande; in short, everywhere where Pueblos are found. It is Pueblo pottery, in the widest sense of the term, as well as in its narrowest acceptance. The basis for the decoration is always the well-known religious symbols of Pueblo ritual, only more elaborately and tastefully combined and modified. We recognize the clouds, the earth, rain, the "double line of life," but there is a progress in execution, as well as in combination of the figures. Only near Casas Grandes do we find a decided improvement in the form of the hand-mills or metates. Those on the Mimbres and its vicinity are as rude as any further south. The same may be said of mortars and pestles, which are sometimes decorated with attempts at the carving of animal forms. Trinkets and fetiches seem to be the same everywhere as far as latitude of 29°. Of textile fabrics, cotton has not been found on the upper Gila, as far as I know, but the yucca has played a great role in dress and fictile work. Mats of yucca, plaited kilts of the same material, resembling those described as worn by the Zunis three centuries ago, sandals and yucca thread (pita) have been found in sheltered ruins. In a cave village on the upper Gila, I noticed a piece of rabbit fur twisted around a core of yucca thread. Of such strips the rabbit mantles of the Moquis, which Fray Marcos heard of, and was, of course, unable to understand, were made, and are made at this day. Turquoise beads are not unfrequently met with, associated with shell beads.†



WATER JAR.*

II. We turn from the subject of the distribution of relics, to consider their characteristics. We have already said that the relics of the Cliff Dwellers resemble those of the Pueblos of the more ancient type. Together they constitute a very unique series. They are, in fact, as unique as are the relics of the Lake Dwellings in Switzerland, but instead of belonging to the borders of the neolithic and bronze age, as they do, they constitute a subdivision of the neolithic age. The relics of the Mound-Builders make a subdivision on the one side, and those of Mexico and the far southwest a subdivision on the other side. The relics from the tribes of the northwest and those of the Canadian tribes of the northeast, also make other subdivisions of the same age. The Cliff-Dwellers' relics are so

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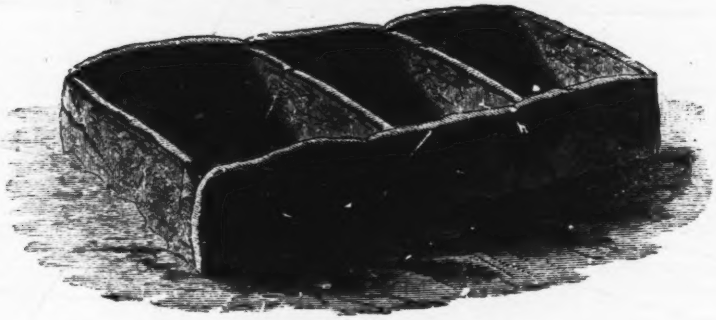
[*] The ornamentation and shape of this vessel show much taste.

[†] Paper of the Archæological Institute of America—American Series, 1892; pp. 350-352; by A. F. Bandelier.

marked in their characteristics that they can be easily recognized in any museum or large collection, even if they are not placed in separate rooms.

They are very instructive, as they suggest a stage of progress and cultural condition which was distinctive. They indicate a peaceful and sedentary life, as a large number of them consist of implements which were used in industrial pursuits; the pottery exceeding in number and interest, all other specimens. They may be divided into several classes, as follows: 1. Those which were made of stone, whether used as weapons of war, for industrial pursuits, or for domestic purposes. 2. Those which were wrought from wood, the most of them being implements which were used in agriculture; others, articles used for weaving and other domestic purposes. 3. Those which were made of shell, turquoise, and other material, and used for personal ornament. 4. The pottery which is found in great quantities, great varieties of shape, and in many patterns. 5. Textile fabrics, which are of two or three classes: (1) Those made from wood, such as willow and bark; (2) those made from yucca and other plants—especially cotton; (3) those made from feathers and skins of animals. It will be interesting to take up these different classes of relics and examine them in turn.



METATE FROM THE ZUNI PUEBLO.

1. We begin with the stone relics which were used for ordinary purposes, and mention first those discovered near the cliff dwellings of the San Juan. There are many weapons of war and the chase among the relics, such as arrow heads, spears, lance heads, darts, battle axes, tomahawks and arrow polishers or straigtheners. Mr. Barber says:

> The great number of war arrows are undoubtedly of Ute origin, having been projected into the midst of the ancient towns, but some, at least, are the productions of the beseiged, although they were eminently a peaceful

people. We would not expect to discover these weapons of the Pueblo race, however, immediately under the walls of their own buildings, but rather further out on the plains. The majority of our specimens were found in the close neighborbood of the mural remains.

It is undisputable that great battles have been fought here. Among the relics of battles are the barbed arrow heads, which were used as missiles; many of which were probably shot from the loop hole forts by the warriors who were stationed there to watch against the approach of enemies. The arrow heads are particularly noticeable on account of their delicacy, perfection, symmetry, diminutiveness and exquisite coloring. We first find them varying from less than half an inch in length to three inches. The materials are of agate, jasper, chalcedony, flint, carnelian, quartz, sandstone, obsedian, silicified and agatized wood. Sometimes we find a beautiful transparent amber-colored chalcedony specimen; again, a flesh-colored arrow head made of agatized wood; and another of a pea-green tint, red jasper, flint of every shade and color. According to form, they may be classified into nine divisions: (1) leaf shaped; (2) triangular; (3) indented at the base; (4) stemmed; (5) barbed; (6) beveled; (7) diamond shaped; (8) oval shaped; (9) shape of a serpent's head. The leaf shaped occur more numerously at a distance from the ruins on the plains, where they have been employed in the slaying of game, but the barbed near the cliff dwellings. The smaller variety of axes may have been used as tomahawks. Household implements were more widely distributed than the weapons. They were scattered through all the ruins; the majority crudely made, but some of them smoothly polished and ground to a cutting edge. A number of forms of hammers and mauls were discovered, varying in weight from a few ounces to twenty-five pounds. They were usually made of compact sandstone, and were cylindrical with the groove of the handle extending around the circumference at one end. The heavy mauls must have required more than one pair of hands to wield them. Some of the hammers were ovoid, with the groove extending around the centre, so that either side could be used at will.

AXE.

Numerous serrated implements were picked up among the debris of the ruins, of different sizes and forms, which were evidently intended for sawing. The fragments of some indicated that the entire instrument had been several inches in length, and one inch or so broad. One, however, was a circular stone, of a bright green color, in which the entire circumference (with the exception of a small arc) had been toothed or chipped. This was probably used in the same manner as the straight saws, being held between the finger and the thumb.

Chisels, awls, borers and rimmers occur in abundance. The chisels or pointed tools were probably used in chipping out hieroglyphics. The awls, borers and rimmers were employed in perforating skins, wood, stone, etc.

Stone mortars are rare in a state of entirety, yet we found many fragments scattered over the plains and through the canyons. The prevailing material seems to have been sandstone Pestles are very rarely seen. However in the Moqui village, I observed several stone mortars, some eight or ten inches in diameter, with their accompanying pestles, which had been placed on the house tops; and I was told that they had not been in use for many years, having descended with many old stone implements from the forefathers of the tribe.

One of the most common objects to be found in and about the crumbling buildings is the millstone or *metate*, and with it the corn grinder. Lieut. Emory says of the ancient remains along the Gila River: 'The implements for grinding corn, and the broken pottery, were the only vestiges of the mechanical arts which we saw amongst the ruins, with the exception of a few ornaments, principally immense well-turned beads, the size of a hen's egg.'[*]

AXES OE CLIFF-DWELLERS.

Mr. Nordenskjold discovered stone relics among the cliff dwellings which should be classed with the implements and weapons. At Mug House he found skinning knives made of quartzite, also drills and stone axes; at Kodak House, a flint knife of black slate, arrow head and spear head, scalper, a metate made of brown sandstone, large stone hammer, a large rough-hewn circular mortar, rounded stones used for grinding, and long flat disks of wood, baskets of woven yucca, made water tight and coated on the inside; gourds and squashes, mats made of withes split and held together by cords of yucca, snow shoes and pieces of cotton cloth.

For the sake of comparison, we turn to the stone relics of the Pueblos. They were mainly relics designed for industrial and domestic purposes. They consist of hammers, mauls, stone axes, knives, saws, chisels, darts, rimmers, borers, scrapers or fleshers, mortars, pestles, mill stones, metates, grinders, arrow polishers, perforated stones for drawing out sinew, gauges, and pounders. These resemble the stone relics found in other parts of the country, and especially those found among the Pueblos.

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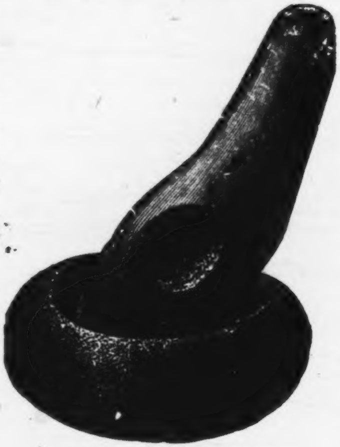
[*] "American Naturalist," 1877.

A very large collection of them has been gathered in the National Museum. Catalogues have been published at different times. That which was prepared in 1879 by Mr. James Stevenson, and published in 1881, is, perhaps, the earliest and most reliable. We give a plate* on which the axes are represented, taken from this report. Of these, Mr. Stevenson says:†

> No. 42257 is a grooved axe of basalt, the only specimen of this particular form in the collection.
>
> No. 42208 is a large stone celt of coarse sandstone, shaped like a wedge. It is about ten inches long, has four flat sides, and may have been a grinder. Its surface is quite rough and pitted.
>
> No. 42337 is a grooved maul of compact sandstone, almost round. Several such specimens were collected. They have been better preserved than the axes, as their shape adapts them to grinding food, hence they were not used for splitting or cutting.
>
> No. 42213 is a water-worn boulder of quartzite, grooved around the center.
>
> The axes on the plate are of the ordinary form, and show much use. The metate, shown on page 304, is of the ordinary kind. Many such mills or metates are found in nearly every pueblo. The different apartments were designed to hold the meal as it grew finer under the grinding process. Mortars and pestles are also common.



MORTAR AND PESTLE.

Mr. Stevenson described a paint mortar, gathered at Zuni, with a pestle made from a quartz pebble; another, made of sandstone, with a square pestle, designed to move backward and forward, instead of up and down and around. Another mortar is represnted in the cut with a pestle inside of the mortar. The pestle has a pit hole in its side, which was designed to hold the pigment after it was ground, which was used with a brush for decorative purposes. The cup and pestle were found together. Besides these relics, there are many idols, or images, which represent the fetiches, or gods, of the Pueblos. These are made in the shape of animals, such as the wolf, bear, panther, eagle and mole. They sometimes have arrows bound to them.* They form an interesting series which show the religious superstition of the people. The plate, which is taken from the Report of the Ethnological Bureau 1881, illustrates this. Mr. Cushing has described them and their uses.

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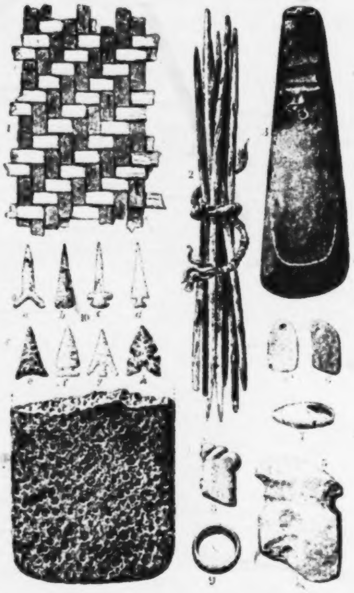
*See page 298. The numbers refer to the catalogue number of the museum.

†See Second Annual Report Bureau Ethnology, 1881, pp. 330-465.

2. All of the explorers have spoken of the mechanical tools which are found among the cliff dwellings, though some of them were at a loss to know to what use they were put. Mr. Holmes described a series of relics which were discovered in the cliff dwellings of Mancos Cañon, some of which were wood and stone, and a few of shell, and gives a cut to illustrate them. He says:



ARROW HEADS, FLESHER AND GRINDER FROM MANCOS CANYON.

> This cut contains drawings of a number of stone implements, arrow heads, ornaments, and other articles manufactured or used by the ancient inhabitants of this region. Nearly all were found so associated with the architectural remains, that I do not hesitate to assign them to the same period.
>
> No. 1 represents a small fragment of rush matting. A large piece of which was found on the floor of one of the cliff houses of the Rio Mancos. It was manufactured from a species of rush, that grows somewhat plentifully along the Mancos bottoms.
>
> No. 2 represents a bundle of small sticks, probably used in playing some game. They are nearly a foot in length, and have been sharpened at one end by scraping and grinding. They were found in one of the cliff houses of the Mancos, buried beneath a pile of rubbish. The bit of cord, with which they were tied, is made of a flax-like fiber, carefully twisted and wrapped with coarse strips of yucca bark; beside this, a number of short pieces of rope of different sizes were found, that in beauty and strength would do credit to any people. The fiber is a little coarser and lighter than flax, and was probably obtained from a species of yucca, which grows everywhere in the southwest.
>
> No. 3 is a very perfect specimen of stone implement, found buried in a bin of charred corn in one of the Mancos Cliff houses.* It is 8 inches in length, and 2½ inches broad at the broadest part; its greatest thickness is only ½ inch. One face is slightly convex, while the other is nearly flat The sides are neatly and uniformly rounded, and the edge is quite sharp.

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*See Report Ethnological Bureau, 1880, Vol. II., p. 27; "Book on Myths and Symbols;" also, AMERICAN ANTIQUARIAN.

*Specimens of this kind of celt or flesher are very numerous among the Cliff-Dwellers. Mr. Nordenskjold has described several as found in Cliff Palace and other localities. The arrow heads illustrate the different shapes which are described by Mr. E. A. Barber.

It is made of a very hard, fine-grained, siliceous slate; is gray in color, and has been ground into shape and polished in a most masterly manner. Although its use is not positively determined, it belongs, in all probabitity, to a class of implements called "scrapers," which are employed by most savage tribes in the dressing of skins. This specimen may have been used for other purposes, but certainly not for cutting or striking, as the metal is very brittle. The most conclusive proof of its use, is the appearance of the edge, which shows just such markings as would be produced by rubbing or scraping a tough, sinewy surface.

No. 4 represents a part of a metate or millstone. The complete implement consists of two parts—a large block of stone with a concave surface, upon which the maize is placed, and a carefully dressed, but coarse grained slab of stone for grinding. This slab is generally from eight to twelve inches long by three to six inches wide, and from one to two inches thick. The specimen illustated is made of black cellular basalt, and was found, with many others, at the ruined pueblo near Ojo Calcinte, New Mexico.

No. 5 is a very much worn specimen of stone axe, which was found at an ancient ruin near Abiquiu, New Mexico. It is made of light colored chloritic schist, and measures two inches in width by three in length.

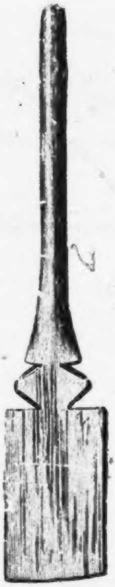
No. 6 and 6a are specimens of ear ornaments, such as are found in connection with very many of the ruins of southern Colorado, These are made of fine-grained gray slate, only moderately well polished, one measured an inch and a quarter in length.

No. 7 represents a marine shell of the genus *Olivella*, obtained probably from the Pacific coast. Large numbers of this and allied shells are found about these ruins. They are generally pierced, and were doubtless used as beads.

No. 8 represents a small carved figure found on the Rio Mancos. It is made of gray slate. Its use or meaning can not be determined.

No. 9 represents a stone ring, five-eighths of an inch in diametar, and pnobably intended for the finger. It is made of hard gray slate; is shaped like the usual plain gold ring, and is quite symmetrical.

No. 10 represents arrow heads which were found associated with nearly every ruin examined. They present a great variety of form; some of the more striking of these are given in the cut. The materials used in their manufacture are principally the more beautiful varieties of obsidian, jasper and agate.*



WOODEN SHOVEL.†

Mr. Stevenson has described certain wooden relics from the Zuni pueblos. One of them is an ordinary shovel, which was used to shovel the snow off the roofs; another is the bow and drill, which was used for drilling stone A cut is also given, in which a native is represented as sitting upon a Navajo blanket, dressed in the usual costume now worn by the Zunis, drilling a hole in a turquoise. The cut illustrates the manner in which the drill was used.‡

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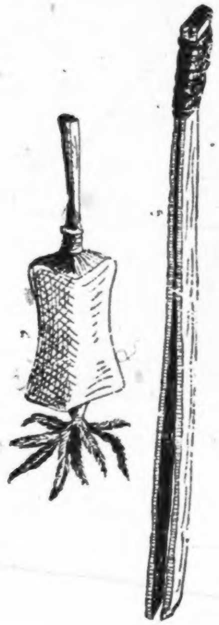
*"A Notice of the Ancient Remains of Southwestern Colorado Examined During the Summer of 1875," by W. H. Holmes; pp. 23 and 24.

†This relic is from the Zuni Pueblo.

‡Third Annual Report Bureau Ethnology, p. 582.

3. The personal adornments of the Cliff-Dwellers are worthy of notice. They may be classed according to material, as follows: Bead ornaments made from shells or earthernware; necklaces made from bone, horn, stone, claws and teeth of animals; ear pendants of turquoise; feather head dresses; woven sashes; fringes of fur, and tassels of fur and fibre. The following description is by Mr. E. A. Barber:

> The marine shells were converted into beads by the ancient tribes, but they are valued highly by the present Navajo Indians, who were constantly grubbing about the old buildings and adjacent graves in search of these trinkets, which accounts in same manner for their great scarcity in the ruins to-day. They were undoubtedly obtained by the ancients from other tribes, which brought them all the shells from which they were fashioned from the Pacific coast.
>
> Of the second class of ornaments, many are found among the heaps of ancient pottery which surround all the ruined buildings. A small piece of pottery, generally of the best glazed and painted ware, is taken and the edges ground down to a rectangular or circular form, from a ½ inch to 1½ inches in length. The circular specimens have perforations in the centre; the square, have holes near one end.
>
> The turquoises were obtained from the Los Cerillos Mountains in New Mexico, south-east of Santa Fe. Here is a quarry which was worked before the arrival of the Spaniards, and it was here, undoubtedly, that the ancient Cliff-Dwellers obtained their turquoises Here, probably, the Moquis, Puebios and Zunis procured the turquoises mentioned by the Friar Marco de Nica in 1339, and by Coronado in 1540. Marco de Nica wrote: 'They have emeralds and other jewels, although they esteem none so much as turquoises, wherewith they adorn the walls of the porches of their houses and their apparel and mules. They use them instead of money all through the country. The last class of bead ornaments or pendants were made of stone or silcified wood, and were used as ear-rings or necklaces. They vary from half an inch to two inches in length. They were suspended from either circular ear drops or from the front of necklaces. Such ornaments are still worn among the Mojaves, Moquis and Znnis.'*



RATTLE AND CLAPPER.†

Mr. Bandelier says:

> Turquoise beads and ear pendants, associated with shell beads, are not unfrequently met with at Casas Grandes in Chihuahua. In central Arizona copper has been found on the upper and lower Salado. I have seen many turquoise beads, and ear pendants of turquoises precisely like those worn by the Pueblo Indians, to-day; also shell beads and many shells entire, as well as broken and perforated. The following species have been identified from the copies made by me in colors: *Turritella Broderipiana*, a species from the Pacific coast; *Conus regulari*, from the West Indies, and a *Columbella*, locality not given. All the univalves found at Casas Grandes,

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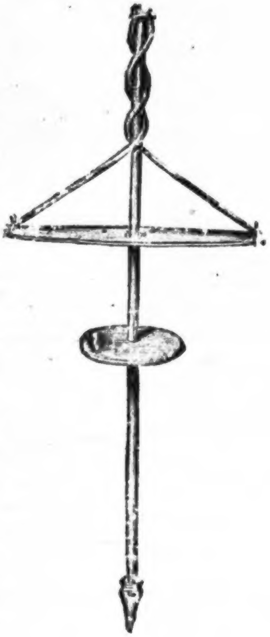
* "American Naturalist," 1877.

† This relic is from the Zuni Pueblo.

as far as I know, are marine shells. The finding of such shells at a point so far away from the sea coast and nearly equidistant from the gulfs of Mexico and of California, is a remarkable feature, implying a primitive commerce, or inter-tribal warfare, which carried the objects to the inland pueblo at Casas Grandes.*

4. The pottery from the cliff dwellings is next to be considered. It is worthy of notice that the coiled and corrugated pottery and that in black and white are found in great abundance in nearly all of the cliff dwellings—those on the Mancos, Rio de Chelley, Rio Verde and on the Rio Grande—and are regarded as the oldest of all. There are specimens of pottery in red and various colors and with different patterns found among the Pueblos. This would indicate that the Cliff-Dwellers were older than the Pueblos, and that the stage of culture similar to theirs had spread throughout the entire region; but at a later date, though preceding the advent of the Spaniards, a new style was introduced. The proof of this is seen in the recent explorations by J. Walter Fewkes among the ruins of Sikyatki and among the Hopi Pueblos. The pottery which he discovered was of quite a different style and color from that of the Cliff-Dwellers, and contains many very interesting mythologic figures, such as the man eagle, the war god, the serpent and unknown reptiles, and the germ goddess, as well as the mountain lion. These symbols show that a mythology arose among the Pueblos, which did not exist among the Cliff-Dwellers.



DRILL AND BOW.†

Mr. W, H. Holmes speaks of the pottery of the Cliff-Dwellers in the following terms:

> The study of the fragmentary ware found about the ruins is very interesting, and its immense quantity is a constant matter of wonder. On one occasion, while encamped near the foot of the Mancos Canyon, I undertook to collect all fragments of vessels of different designs within a certain space, and by selecting pieces having peculiarly marked rims, I was able to say with certainty that within ten feet square, there were fragments of fifty-five different vessels. In shape, these vessels have been so varied that few forms known to civilized art could not be found. Fragments of bowls, cups, jugs, pitchers, urns and vases, in infinite variety, may be obtained in nearly every heap of debris.

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* Papers of the Archæological Institute of America,—American Series,—Vol. IV., p. 553.

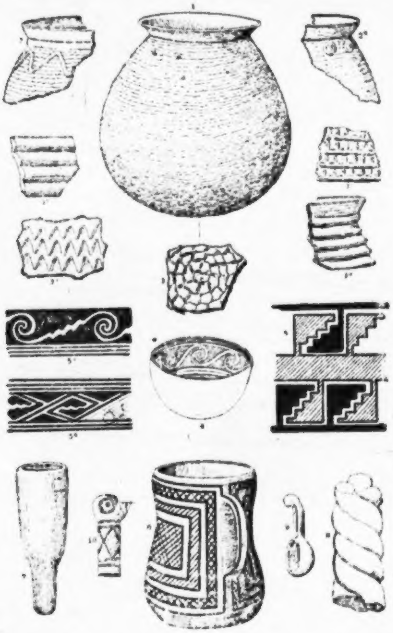
† This relic is from the Zuni Pueblo.

The art of ornamentation seems to have been especially cultivated, as very few specimens are found that are not painted, indented or covered with raised figures. Indeed, these ornamented designs are often so admirable, and apparently so far in advance of the art ideas of these people in other respects, that one is led to suspect that they may be of foreign origin. This suspicion is in a measure strenghtened when we discover the scroll and the fret struggling for existence among the rude scrawlings of an artisan, who seems to have made them recognizable rather by accident, than otherwise. It is not improbable, however, that the specimens referred to are but rude copies of models designed by more accomplished artists, or procured from some distant tribes.

No. 1. represents a large vessel obtained in one of the Mancos Cliff houses. It is of the corrugated variety, has a capacity of about three gallons, and was probably used for carrying or keeping on hand a supply of water. In the specimen figured the workman has begun near the centre of the rounded bottom and laid a strip in a continuous, but irregular, spiral (No. 3), until the rim was reached; indenting the whole surface irregularly with the finger. Two small conical bits of clay have been set in near the rim, as if for ornament. Other specimens have small spirals, while others have scrolls, and still others very graceful festoons of clay (Nos. 2 and 2*a*). A number of the more distinct styles of indentation are given in connection with this figure (Nos. 3, 3*a*, 3*b*, 3*c* and 3*d*).

No. 4 is a bowl restored from a large fragment. It is painted both inside and out, and the designs are applied with rather more than usual care.

Nos. 5, 5*a* and 5*b* are prominent among the ornamental designs. I have corrected the drawing, but have introduced no new element.



POTTERY DESCRIBED BY W. H. HOLMES.

No. 6 represents a very usual pattern of mug or cup. It is of the ordidary painted ware, and is made to contain about a pint. The specimen is not entire.

No. 7 is apparently a pipe. It was found by Mr. Aldrich, near a ruin on the San Juan, and is made of the ordinary potter's clay; it is two inches in length.

No. 8 represents part of an ornamental handle, formed by twisting together three small rolls of clay.

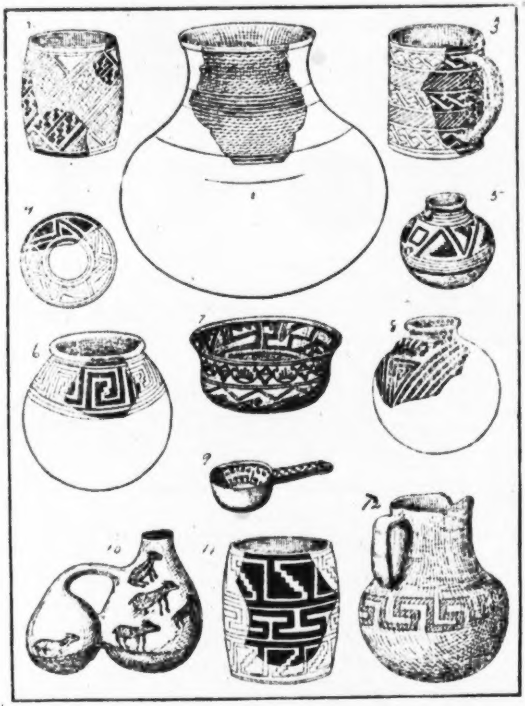
No. 9 represents a small spoon or ladle. Fragments of similar implements are quite numerous.

No. 10 is a portion of the handle of some small vessel.

As to whether the manufacture of pottery was carried on in certain favorable localities only, or whether each village had its own skilled workmen or workwomen, I can not determine, since, as previously stated, no remains of kilns or manufactories were discovered. The forms and styles of ornament are pretty uniform, which is to be expected in either case, since the inhabitants of the various villages must have had constant communication with each other.*

Mr. Jackson says of the pottery of Mancos Cañon:

All who have ever visited this region, which extends from the Rio Grande to the Colorado, and southwest to the Gila, have been impressed with the vast quantities of shattered pottery scattered over the whole land; sometimes where not even a ruin now remains, its more enduring nature enabling it to long outlive all other specimens of their handiwork. It is especially instructing, as enabling us to see at a glance the proficiency they had attained in its manufacture and ornamentation, displaying an appreciation of proportion and a fertility of invention in decoration, that makes us almost doubt their ante-Columbian origin; but, nevertheless, without going into the details, we believe them to antedate the Spanish occupancy of this country, and to owe none of their excellence to European influences, being very likely an indigenous product.



POTTERY DESCRIBED BY W. H. JACKSON.

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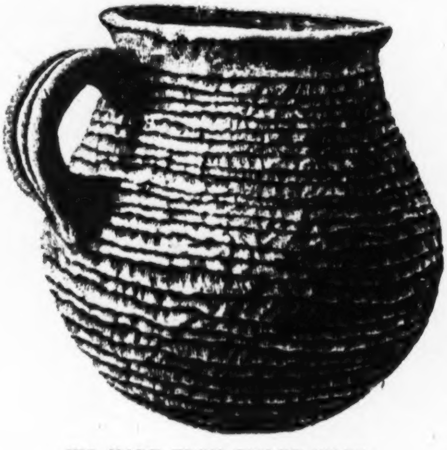
* "A Notice of the Ancient Remains of Southwestern Colorado, Examined During the Summer of 1875," by W. H. Holmes; pp. 21, 22 and 23.

No. 1 is a jar from the valley of Epsom Creek, of dark gray and rather coarse material, without color or glaze, of the indented and banded ware peculiar to the ancient artificers only. It is made by drawing the clay into ropes, and then, commencing at the bottom, building up by a continuous spiral course, each layer overlapping the one under it; the indentation being produced by a pressure with the end of the thumb, and by a slight doubling up of the cord of clay. The design is varied by running several courses around quite plain. Its diameter was 18 inches, with the same height, and 9 inches across the mouth. For so large a vessel, it was very thin, not more than one-fourth of an inch. Inside, the surface was rubbed perfectly smooth,

Nos. 2, 3 and 11 are restorations from well preserved fragments of mugs or cups, each elaborately ornamented in black on a white glazed ground; the last one, especially, is of firm, excellent ware, and the design is put on with great precision. The first two are 3½ inches in diameter and 4 inches high, and the last one 4½ inches in diameter by 5 inches in height.



JUG MADE FROM COILED WARE.

No. 4 is a flat disk of pottery for covering a jar.

No. 5 is the small jug found at the great cave ruin on the Rio de Chelley; it is 3½ inches in diameter, of dark gray ware, perfectly round and very neatly painted. The handle has been broken off, but leaving the marks where it had been attached.

No. 6 is a slightly oval-shaped jar, 10 inches in diameter, and a mouth 5 inches wide, with the lip rolling over sufficiently to attach a cord to carry it by.

No. 8 is a small jug, with side-handles and narrow neck, 4½ inches in diameter and 1¾ inch across the mouth.

No. 9 is a cup or dipper from Montezuma Canyon; bowl, 3½ inches in diameter; handle, 4 inches long.

No. 12 is a pitcher, taken from a grave on the banks of the San Juan, near the mouth of the Mancos, by Captain Moss. In the same find, were other similar vessels, some polished stone implements and a human jaw bone. The ware of this pitcher is a coarse, gray material; somewhat roughly modeled, but of fine form and tasteful decoration.

No. 10 is a peculiar vessel, found among the Moquis or Tegues. They could give no account as to where it came from, or who made it. It is probably of Zuni manufacture. The material is rather soft, being easily cut with a knife. The upper portion is painted or glazed white, and the lower red; the figures are painted in red and black. The tallest portion is 6 inches in height.

No. 7 is an example of the modern work of the Moquis or Tegues. The material and workmanship are far below any of the preceding examples; approaching them only in its ornamentation, which is strictly inventional, but somewhat bizarre.*

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*"A Notice of the Ancient Ruins in Arizona and Utah, Lying About the Rio San Juan," by W. H. Jackson; pp. 44-45.

5. The collections made by Mr. Nordenskjold while exploring the cliff dwellings are important in this connection. He discovered a large amount of pottery, consisting of several kinds: (1) Coiled ware; (2) plain ware, undecorated; (3) plain, with indented ornaments; (4) ware, painted in red, black and white. He also found woven and plaited articles; wicker work; mocassins; plaited ropes; feather cloth; loom woven nets; a whole jacket of skin, found in a grave; several skin pouches; cord wrapped in a thong of hide; necklaces of shell; a head-dress of feathers, tied in rows, designed for plumes; cotton cloth; a belt or head piece, made with a wrap of yucca and a woof of cotton; a double-woven band; a bag or pouch, made from the skin of a prairie dog, filled with salt, and sewn together in such a manner as to leave the hole, corresponding to the mouth of the animal; also a necklace of turquoises and white beads, which were perforated; a black bead of jet, found at Spring House; a cylinder of polished hematite; a mummy, shrouded in a net work of cord with thongs of hide, and the feet clad in mocassins of hide; also a large piece of feather cloth wrapped around the skeleton of a child, and, at Step House, a shroud of feather cloth.

PUEBLO WOMAN WITH POTTERY JAR.*

At this place, he found a large vase of coiled ware, holding twenty-five litres; also a jar in a net of yucca; a large jar with a tasteful indented pattern in triangles; a large, shallow bowl, ornamented with regular designs; and, at Spring House, an oblong vessel, probably a lamp. It resembled a bowl, but had two loops on the top, designed to be held with cords and hung to the wall. There were cotton wicks placed in the opening or mouth. He also discovered a ladle with handles; black and white bowls, encircled by a black line and black streaks running obliquely down, making a step pattern; bowls with a black pattern on a white ground; a large bowl with a meander pattern and parallel lines, executed with great skill; a bowl with an especially handsome ornament in black on a gray ground; a large bowl with a black ornament on a white ground, with a handsome meander.

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*This cut, representing a modern Zuni women with pottery jar on her head, is given to how the contrast between the Cliff-Dwellers' pottery and that of the modern Pueblos.

At Step House, he found a bowl with a suastika on the outside, with white diamonds and black spots on the inside; this was in a grave; also a fragment of a large bowl with a suastika, and a scroll in black with a large leaf in black and gray; also a mug, ornamented in black and white; spoons with ornaments, some running parallel, others with transverse bars; a large spherical jar and ladles and dippers; one beautiful jar of red ware, with spiral coils, perfect in form and design; its fine details and coils executed with great care, the figures in curved and spiral lines. These finds by Mr. Nordenskjold are very important, especially of the red ware and of the suastikas.

Some maintain that the Cliff-Dwellers were a very ancient people, and were, in fact, the ancestors of the Aztecs, and that the famous migration from the Seven Caves, described by the Mexican picture records, was from this region. Others maintain that they were quite modern, and were the same as the Pueblos, and occupied the cliffs as resorts while cultivating the soil and remained there until after the arrival of the Spaniards. The examination of the relics gathered from the cliff dwellings, however, disproves both of these positions.

There is, in the first place, not a single ornament which resembles those used by the Aztecs, and the ordinary relics are of a very different character. In the second place, most of the pottery is entirely different from that used by the modern Pueblos, and lacks the symbols and ornaments which are supposed to have been introduced among them late in their history. They give no evidence of contact with the white man. There are, to be sure, such symbols as the suastika, the Greek fret, the Egyptian tau, the scroll, the volute and the stepped figure which are common in oriental countries, but these are world-wide in their distribution, and seem to be almost universal.

We conclude that the Cliff-Dwellers received them from the same source that the Mound-Builders of the Mississippi valley and the civilized tribes of the southwest did. The stepped figure is not found among the mounds, but nearly all the other symbols are. The plumed serpent is especially prominent.

These same symbols are very common among the Pueblos, but in addition to them there are many figures which seem to have had a later origin, perhaps were introduced after the advent of the Spaniards.

# CHAPTER XVI.

## AGRICULTURE AMONG THE PUEBLOS AND CLIFF-DWELLERS.

There is one question connected with the Cliff-Dwellers, which to some has been difficult to answer, namely, how does it happen that they, in the midst of their strange surroundings, should be so superior to the wild tribes which have for many generations infested the region? This can not be ascribed to any natural superiority, for, so far as known, they were quiet people, and somewhat sluggish in their habits, and manifested much less energy and strength than the people they considered their enemies. Some have accounted for it on the ground that there was here an inherited civilization, one which had been introduced from the regions far to the southwest—Mexico, or possibly Nicaraugua, the signs of which are to be seen in the ancient ruins at Quemada and the Casas Grandes in Sonora.

The key to the problem, however, is undoubtedly furnished in the fact that the Pueblos and the Cliff-Dwellers alike were, and had been from time immemorial, agriculturists, and this led them to a sedentary, life which would naturally result in their continued improvement, and so produced the same contrast between them and their neighbors that exists elsewhere between the civilized and the uncivilized.

It is certain that they were so thoroughly given to agriculture, that they continued it under the most unfavorable circumstances, even when driven to the greatest straits from the constant presence of an enemy which threatened to attack their homes, and were often successful in destroying their crops and so depriving them of their common subsistence. In this they differed from the wild tribes, who were hunters and had no permanent dwelling place, but were nomads and wandered from place to place, according as the spirit moved them. This peculiarity was noticed by the Spaniards when they first reached the region, although at that time the contrast between them and the wild tribes did not strike them as forcibly as it has others, for they came from a region where a sedentary life was common and agriculture was the rule, rather than the exception. To the American explorers, it was more of a surprise, for they were accustomed to the ways of the hunters and considered all of the aborigines in the light of nomades who occasionally resorted to agriculture as merely incidental to the hunter life.

The modern archæologists understand that this furnishes the clew to the whole problem of society as it existed among both the Pueblos and the Cliff-Dwellers, and fully accounts for the difference between them and the people who were besieging them. It is well known that the three stages of savagery, barbarism and civilization are attended by different modes of life and different means of subsistence, and that the savages are generally nomads, that agriculture is distinctive of barbarism, and that dwelling in cities is frequently a sign of civilization.

The fact that the Pueblos were practising agriculture raises them above others, one whole stage in the scale of human progress. It is not often, however, that the lines are so strongly drawn and the contrast so marked as here. It is like the mesas which rise above the level of the valley abruptly, and upon the mesas the terraced houses are sometimes conspicuous from their very height; so the practice of agriculture raises the people above the mass of humanity which was still held in the low plains of savagery, the very houses which were erected being in contrast to the huts which savages occupied.

Some maintain that whatever civilization there was in America in prehistoric times was owing to agriculture, and the change from the nomadic state to a sedentary life. This position was held by Mr. Morgan. It was also the opinion of Baron von Humboldt, who speaks of the value of agriculture in maintaining the original population and keeping it up to a high stage of development, in the following words:

> If at the commencement of the empire of the Incas of Peru in the cordilleras of Quito and the elevated plains of New Granda, and in the Mexican Anahuac, the population has maintained itself and in some points even considerably increased, the cause must be sought in the fact that hundreds of years before the Spanish Conquest, the population consisted of agricultural tribes.. In general views of the manifold grades of intelligence manifested by those who are so vaguely and often improperly denominated savages, the imagination is carried back of the present to an indefinite past, in which the greater part of the human race lived in the same condition; but even in the savage state, we are struck by signs of spontaneous awakening in intellectual power, in the knowledge of several languages and the anticipation of a future existence, and in traditions that boldly rise to the origin of the human race and its abode. The hordes which occupy the country between New Mexico and the river Gila, especially attract our attention, because they are scattered along the line of march which, in the period from the sixth to the twelfth centuries, the various nations known as the Toltecs, Chicamecs, Nahuas and Aztecs proceeded, when they traversed and peopled southern tropical Mexico.
>
> Memorials remain of the architectural and industrial skill of the nations, who had evidently attained a high degree of culture. The various stations or abiding places of the Aztecs can still be pointed out by means of historical paintings and ancient traditions, and the large, many-storied houses seen in this region offer analogies as to the mode of building in use among the southern tribes.
>
> In the case of the American migrations of nations from north to south, might not single tribes have remained behind north of the Gila? All the conjectures connected with this bold hypothesis concerning the sources of a certain amount of civilization, evident in the original seats of wandering nations, have fallen into the abyss of historic myths. Want of faith in finding a satisfactory solution of the problem, must, nevertheless, not be allowed to lessen our diligence, or set limits to our inquiries. The far more

extensive and flatter eastern regions, though covered with a net work of rivers, was inhabited only by savage tribes, isolated and scarcely capable of any co-operation for a warlike undertaking, and maintaining themselves wholly by hunting and fishing.

I. The point which interests us, is that agriculture was so wide-spread among the Pueblos. This was the one thing which made the difference between them and the wild tribes which have continued to inhabit the same region. This is illustrated by the facts which have been made known by the different explorers who passed through the country when the aborigines of both classes were occupying the region, and when they were left to their natural tastes, without the restraining influence of any army or the presence of any civilized people.

If we begin with the regions situated on the Rio Grande, and pass over the different districts towards the west and north, and take the testimony of the explorers, we shall see how extensive agriculture was in prehistoric times and also see the contrast between the Pueblos and Cliff Dwellers and the hordes which invaded their territory. We shall not run amiss if we take the testimony of any of those who belonged to the exploring expeditions, though some are more explicit in their account of agriculture than others. We shall, therefore, confine ourselves to such accounts. Mr. B. Mollhausen, who accompanied the expedition under Lieutenant Whipple, has given some excellent descriptions of the Pueblos and the deserted villages which he saw, but he has also spoken of the practice of agriculture as almost universal. He first visited San Domingo and the Rio Grande,.and there saw the method of cultivating the soil by irrigation. He says:

> The neighborhood of settlements and cultivated lands was recognizable long before reaching the place, by the canals and ditches which intersected the new lands and were designed to carry the water of the river to the plants and seeds, for without such measures, it would be scarcely possible to raise the most scanty harvest under the arid climate of New Mexico. Flocks of marsh and water birds animate the fields thus irrigated, and under the shelter of the close stalks of Indian corn, some of the sportsmen get effective shots among them.
>
> The valley of the Rio Grande is closely cultivated in many parts, from the mouth up as far as Taos. The inexhaustible wealth of nature, which renders the colonization of America so easy, is not in so high a degree characteristic of New Mexico, and in some places there are great deficiencies, but the fruitful valleys of the Rio Grande and its tributaries, as well as the mountains rich in iron, coal and gold, are profuse enough in their gifts, not only to maintain but to enrich whole nations and carry them to the highest point of civilization.
>
> The Zuni Indians are more favorably disposed to civilization than those of any other Pueblo. Besides agriculture, they, or rather their women, are skillful in the art of weaving and, like the Navajos, manufacture durable blankets. The pueblo, with its terraced houses, elevated streets, numerous ladders and the figures climbing up and down them, tame turkeys and eagles sitting upon the walls, presented an interesting picture, and still more attractive when we looked back upon the wide plain, stripped of its harvest and with a background of grand masses of rock and blue distant mountains.

In speaking of the Colorado Chiquito, Mr. Mollhausen says:

> The fertile soil, quite capable of cultivation, lay on both sides of the river, and more and more ruins, in such quantities as to afford ground for the belief that a wandering race of a remote antiquity had possessed extensive settlements in this valley, where we found every requisite for human subsistence, pure wholesome water and fruitful soil.
>
> The ruins described by Captain Sitgreaves lie at a short distance. They are obviously the remains of extensive settlements that have lain scattered over an area of eight to ten miles about the valley, and which must have been at one time a thickly peopled district. That no water is found near the ruins which lie farthest from the river, is considered sufficient to account for their abandonment. It is, however, scarcely conceivable that in the vicinity of a river that is never dry, there could be a want of water, or that the industrious people could allow their reservoirs to become choked. It is more probable that a general emigration under the repeated attacks of Indian tribes occasioned the abandonment of these numerous towns. It must strike everyone that the more southerly ruins manifest greater culture and experience in their builders, and also indicate that their towns and settlements were more thickly populated and inhabited for a long time.

Mr. Brackenridge, who visited the mounds and monuments opposite St. Louis, called Cahokia Mounds, and gave the earliest description of them, has also furnished a description of the pueblo tribes situated in New Mexico, and especially of their buildings, which he called "castles," and of their agricultural habits. He says:

> Their habits and character were entirely the reverse of a migratory people. These habits fixed them permanently in the spots which they occupied. There never was a people less fitted for migration than the occupants of the Castle Cibola. It will strike most readers as a singular fact that there should be found in America a land of "castles," with successive platforms like those of Babylon, and rising to the height of seven stories, like the pagodas of China. They were not permanent works, like those of the Rhine and the Danube, nor were they the abodes of feudal chiefs; on the contrary, they were places of defense occupied by an industrial population, ruled by councils of elders, and exposed to the war-like depredations of the nomadic savage tribes which lived on the buffalos which swarmed in vast numbers in the regions of the north.
>
> There were no divisions of streets, but the houses were raised one above the other in stories or stages, the roofs projecting over those below, forming sheltered galleries with doors entering into separate apartments. The castles rise from three to seven stories on a solid basement ten feet in height to which there was no entrance, thus serving for defense against their enemies. A fertile valley capable of being irrigated was chosen for the site of the castle, where they cultivated squashes, beans and also a little cotton for their domestic fabrics. Their canals for irrigation and supply of water were of great extent. No domestic animals were used.
>
> It does not appear that the towns were dependent upon any central government, or in any way connected by leagues; the government was uniformily one which was confined to villages or castles.

The following extract from Mr. Bartlett's work will give us an idea of the ruins and villages on the Gila and the Salinas, as well as the Pima villages which were visited by Coronado, as well as the irrigating contrivances which prevailed here. He says:

> In every direction, as far as the eye can reach, are seen heaps of ruined edifices with no portion of their walls standing. One thing is evident, and

that is, that at some former period, the valley of the Gila, from this ruin to the western extremity of the rich bottom land now occupied by the Pimas and Maricopas, as well as the broad valley of the Salinas, for upwards of forty miles, was densely populated; the ruined buildings, the irrigating canals—some of them twenty feet wide, the vast quantities of pottery, show that, while they were an agricultural people, they were much superior to the present uncivilized tribes. Their civilization extended far beyond the district named. From information given by Leroux, it appears that ruins of the same sort exist on the San Francisco or Verde River.

There is one fact which I regard as of importance in forming a conjecture about this people. This is the cultivation of the cotton plant and the use of cotton in the domestic fabrics. This plant was not known to the Northwest Indians, and is nowhere indigenous beyond the tropics, whence they derived it. Was it from Mexico or Peru? There was no intercourse between this region and Mexico. This fact has the appearance of pointing to an Asiatic origin, the strongest argument being that the earliest races of America are uniformly found on the western side of the Continent, and not on the Atlantic side.

Major Powell draws a distinction between the tribes, such as the Utes, Shoshones, Shiwits, Navajos and Apaches, who were hunters and fed upon the flesh of animals killed in the fall, and were clad in skins and furs, and the Pueblos, who lived mainly upon grain, and were clothed for the most part in cotton garments and had reached a higher civilization. He says of the Utes:

These people built their shelters of boughs and bark, and to some extent lived in tents made of the skins of animals. They never cultivated the soil, but gathered wild seeds and roots, and were famous hunters and fishermen. They have always been well clad in skins and furs; the men wore a blouse, loin cloth, leggings and mocassins, and the women dressed in short kilts. Sometimes the men would have a bear or elk skin for a toga, but more often they made their togas by piecing together the skins of wolves, mountain lions, wolverines, wild cats, beavers and otters. The women sometimes made theirs of fawn skins, but rabbit skin robes were far more common. Cords were made of the fibre of wild flax or yucca plants, and around these cords, strips of rabbit skin were rolled so that they made long ropes of rabbit skin coiled, the central coil of vegetable fibre, then these coils were rolled into parallel strings with cross strings of fibre. The robe when finished was about five feet square, and made a good toga for a cold day and a warm blanket for night. Neither men nor women wore a head-dress, except on festival occasions for decoration.

He says of the Shoshones:

The region from Fremont Peak to the Uinta Mountains has been the home of Indians of the Shoshonian family from time immemorial. It is a great hunting and fishing region. The flesh of the animals killed in the fall was dried for summer use. The seeds and fruits were gathered and perserved for winter use. When the seeds were gathered, they were winnowed by tossing them in trays, so that the wind might carry away the chaff; they were roasted in the same trays. Afterward the seeds were ground on mealing stones and moulded into cakes that were stored away for use in time of need.

The Shiwits, "people of the spring"; the Uinkirets, "people of the Pine Mountains," and the Unkakaniguts, "people of the red lands," who dwell along the Vermilion Cliff, are found on the terraced plateaus These people live in shelters made of boughs piled up in circles and covered with juniper bark, supported by poles. These little houses are only large enough for half a dozen persons, huddling together, to sleep. Every year they have great hunts, when scores of rabbits are killed in a single day. It is managed in this way: They make nets of the fibre of the wild flax and of some other plant, the meshes of which are about an inch across, into which they drive the rabbits. A great variety of desert plants furnish them food, as seeds, roots and stalks. More then fifty varieties of such seed-bearing plants have been collected. The seeds themselves are roasted, ground and preserved in cakes. The most abundant food of this nature, is derived from the sunflower and the nuts of the pinon. They will make stone arrow heads, stone knives and stone hammers, and kindle fires with the drill.

In speaking of the inhabitants of the Kanab River and the Vermilion Cliffs, in the heart of the Grand Canyon, who dwelt in pueblos, some of which were three stories high, he says:

> From extensive study of the ruins, it seems that everywhere tribal pueblos were built of considerable dimensions, usually to give shelter to several hundred people. Then the people cultivated the soil by irrigation, and had their gardens and little fields scattered at wide distances about the central pueblos, by little springs and streams, and wherever they could control the water with little labor to bring it on the land. At such points stone houses were erected, sufficient to accommodate from one to two thousand people, and these were occupied during the season of cultivation and are known as rancherias. Sometimes the rancherias were occupied from year to year, especially in time of peace, but usually they were occupied only during seasons of cultivation. Such groups of ruins and pueblos, with accessory rancherias, are still inhabited, and have been described as found throughout the Plateau Province, except far to the north beyond the Uinta Mountains. A great pueblo once existed in the Uinta Valley, on the south side of the mountains. This is the most northern pueblo which has yet been discovered. But the pueblo-building tribes extended beyond the area drained by the Colorado. On the west, there was a pueblo in the Great Basin, at the site now occupied by Salt Lake City, and several more to the southeast, all on waters flowing into the desert. On the east, such pueblos were found among the mountains at the head waters of the Arkansas, Platte and Canadian Rivers. The entire area drained by the Rio Grande del Norte was occupied by Pueblo tribes, and a number are still inhabited. To the south, they extended far beyond the territory of the United States; and the so-called Aztec cities were rather superior pueblos of this character. The known Pueblo tribes of the United States belong to several different linguistic stocks. They are far from being one homogeneous people, for they have not only different languages, but different religions and worship different gods. The Pueblo people are in a higher grade of culture than most Indian tribes of the United States. This is exhibited in the slight superiority of their arts, especially in their architceture.*

Thus we see from the reports of the earliest explorers that, notwithstanding the great number of ruins and the apparent aridity of the soil, agriculture was carried on through the central parts of the Pueblo territory, especially on the Rio Grande, the Little Colorado and the Gila Rivers, though mainly by irrigation. There seem to have been valleys among the mountains of the north, especially along the Rio San Juan, where agriculture was conducted without the aid of irrigation, for, here, the rain was precipitated by means of the mountains often enough, so as to supply needed moisture. This explains the pertinacity with which the Cliff-Dwellers clung to their homes hid away among the mountains, and emphasizes the calamity which came upon them when the nomadic hordes invaded their possessoins.

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*"Canyons of the Colorado," by J. W. Powell; pp. 109-111.

The testimony of all the explorers is that the soil here is extremely fertile and needs but little cultivation to raise excellent crops. Mr. Jackson says:

> The Rio San Juan drains a great interior basin covering over 20,000 square miles, as well as several great mountain masses bordering it. The river at the mouth of the McElmo has an average width of fifty yards, and a depth of four to six feet. The water is warm and well freighted with the soil which it is continually undermining, contrasting strongly with the ice-cold tributaries which give it existence, and the bottoms are from three to five miles in width and, bordering the stream, covered with dense growths of cottonwoods and willows The broad and fertile alluvial lands, well covered with grass, prove a rich agricultural possession.

The Rio de Chelly was also a favorable place for carrying on agriculture. Mr. Mindeleff says of it:

> Near its mouth, the whole bottom of the canyon consists of an even stretch of white sand, extending from cliff to cliff. A little higher up, there were small areas of bottom land and recesses and coves only a foot or two above the bed of the stream. Still higher up, these became more abundant, forming regular benches or terraces. At Casa Blanca, the bench is eight or ten feet above the stream, each little branch canyon and cave in the cliffs is fronted by a more or less extensive area of cultivatable land. These bottom lands are the cultivatable areas of the canyon bottom, and their currents and distribution have dictated the location and occupation of the villages now in ruins. They are also the sites of all the Navajo settlements. The Navajo hogans, or huts, are generally placed directly on the bottoms, the ruins are always located so as to overlook them. Only a very small proportion of the available land is utilized by the Navajos, and not all of it was used by the old villagers.
>
> The horticultural conditions here, while essentially the same in the whole Pueblo region, present some peculiar features. Except for a few modern examples, there are no traces of irrigating works. The village builders did not require irrigation for the successful cultivation of their crops, and under the Indian method of planting and cultivating, a failure to harvest a good crop was rare.
>
> As to the climate: In December, it becomes very cold and so much of the stream is in the shade the greater part of the day, that much of the water becomes frozen. In a short time, great fields of ice are formed. This, and the scant grazing afforded by the bottom lands in winter, accounts for the annual migration of the Navajos; but these conditions would not materially affect the people who did not possess domestic animals, but were purely agricultural. The stream when flowing is seldom more than a foot deep, except in times of flood, when it becomes a raging torrent, hence irrigation would be impracticable, nor is it successful here for extensive horticulture.

These statements throw light upon the former habits of the Cliff-Dwellers of the Rio San Juan and show conclusively that they had their permanent abodes in these canyons, because of the fact that they could easily secure subsistence here, and because they became attached to their mountain home. The evidence is that they first made their homes here as a matter of choice on account of the fertility of the soil, and not on account of the dangers with which they were surrounded. After the invasion of the savages, they were compelled to build their houses high up in the cliffs for the sake of defense, but it is likely that they built them so far above the stream in order to escape the mountain torrents which swept through the valleys, even before the savages came upon them. As Mr. Mindeleff says:

> Canyon de Chelly was occupied because it was the best place in that vicinity for the practice of horticulture. The cliff ruins there, grew out of the same natural conditions that they have in other places. It is not meant that a type of house structure was invented here, and was transferred subsequently to other places. The geological topographical environment, favored their construction. From a different geological structure in other regions, cavate lodges resulted; in other places. there were watch towers, and still others, single rooms. The character of the site occupied is one of the most important evidences to be studied in examination of the ruins in the Pueblo country. The sites here are all selected with a view to an outlook over some adjacent area of cultivable land, and the structures erected were industrial or horticultural, as well as military or defensive. The immense number of storage cists are a natural outgrowth of the conditions there. The storage of water was very seldom attempted. A large proportion of the cists were burial places. As a rule, they are far more difficult of access than the ruins.
>
> In the cliff ruins of De Chelly we have an interesting and most instructive example of the influence of a peculiar and sometimes adverse environment on a primitive people, who entered the region with preconceived and fully developed ideas of house construction, and left it before these ideas were brought fully in accord with the environment, but not before they were influenced by it.

II. The question arises, whether the Cliff-Dwellers had permanent agricultural settlements, or were they merely farming shelters, used by the Pueblos who lived upon the mesas.

1. On this point, it may be well to examine the architecture of the region which has been often described, and concerning which there is more discussion than any other, namely, that found in the Rio de Chelly.

This valley has been described by different explorers, commencing with Col. Simpson, F. T. Bickford and Mr. Mindeleff and others, each one of whom has described the different villages, especially those called the Casa Blanca, or the White House, the village in Mummy Cave, in Canyon del Muerto, and one on the Banito.

Mr. Bickford says that the Canyon de Chelly and its two principal branches, Monumental Canyon and Canyon del Muerto, have an aggregate length of more than forty miles. "They vary in width from 200 to 300 feet, and their walls, which are precipitous throughout, are from 800 to 1,400 feet in height. Through all the branches there run streams of clear water, which unite and form the Little Rio de Chelly. The soil of the canyon is fertile, and under the tillage of a more intelligent race would bear rich crops. Though not comparable in grandeur to the Grand Canyon or the Yosemite, it is, nevertheless, one of the most beautiful of western canyons. The cave villages are found sometimes only thirty feet from the level, and sometimes 800 feet. The reason why such sites were selected does not fully appear. The conclusion so often and so easily reached, is that they were places of refuge from the attacks of the invading races. So far as appearances go, they seem to have been, not the places of occasional retreat, but the regular, permanent dwelling place of their builders. The traces of fires are found in the ruins. Rock paintings abound, and hundreds of shapes of human hands are found adorning some of the roofs of the now inaccessible caves. Symbols are frequent, the dragon fly, the rainbow, the sun, objects of reverence to the living Pueblos. Few animals are pictured, the elk, the antelope and the red deer being the most numerous.

"The most remarkable group of ruins is found in a branch of Monumental Canyon, and is about 700 feet above the bottom of the canyon, which is very narrow. The finest group of ruins, though not the largest, and probably the best specimen of the handiwork of the Cave-Dwellers in existence, is known as the White House. Its site is a cave whose floor is about thirty feet from the bottom of the canyon, and is accessible only by rope-climbing up the vertical face of a perfectly smooth precipice. The first line of structures have their fronts flush with the precipice; their position, together with their little loop hole windows and irregularly castellated tops, suggesting that they were designed as the outer line of a strong fortress. Rising above this line, are seen the walls of an inner and smaller structure, which, being painted white, forms a conspicuous and attractive feature in a most remarkable landscape. Above, 900 feet of smooth, bellying rock so overhangs the place that a plumb-line from its crest would pass about seventy feet in front of the outermost wall of the old village. The cave has a lateral reach of ninety-four feet, and a depth of forty feet. The ruin is called by the Navajos something which signifies "the abode of many captains." It is the only painted cave dwelling of which we have any knowledge. Dados, with borders of saw teeth and rows of dots, all in yellow paint, adorn the rooms, the alignment of which is better and the plastering smoother than usual. There are seventeen rooms in the cave.

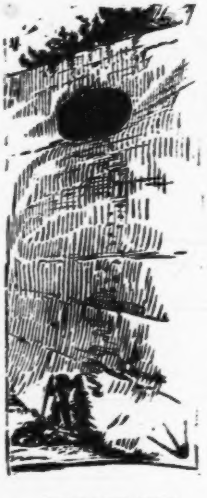
"The largest group of ruins in this vicinity, and probably the largest of its class—cave dwellings of masonry—in the world, is that discovered by Stevenson. It is found near the head of Canyon del Muerto, and is known as Mummy Cave, from the fact that its discoverer found near it an undisturbed cist, from which he removed a well preserved mummy. The southern wall of the canyon here retreats, forming a wide, shallow bay, around which, at the height of about 200 feet from the bottom, there extends a sloping shelf which was terraced by the ancients to make the foundation of their village. The crest of the precipice extends far enough to cover the entire group, which was probably the home of more than a thousand individuals. The terrace and all that stand upon it has fallen away, and now forms part of an immense mass of debris, which makes the cave more easily accessible. Only those walls remain which are founded upon the solid rock at the back of the cave, and many of these show little more than the foundation lines. The evidence of an aristocracy, or controlling class, is here very striking. The cave is shaped like two unequal crescents joined end to end, and the apartments, or rather cells, of the two portions are small and of irregular form, following the conformation of the rock. At the point of junction, however, covering almost entirely the narrower shelf, there stands a rectangular tower, three stories in height; the rooms of which, as well as those in its immediate neighborhood, are larger, and the walls and floors much better in construction than those upon either side. The tower commands the village, as feudal towns were commanded by the castles of their lords."

2. The distribution of kivas in the ruins of De Chelly affords another indication that the occupancy of the region was permanent. The position of the kivas in some of the settlements on defensive sites, and their arrangement across the front of the cave, suggests at first sight, that they were used for outlooks and their occupancy by villages came at a later period. Kivas are found only in permanent settlements. They are sacred chambers in which the civil and religious affairs of the tribe were transacted. They also formed a place of resort or club for the men. Their functions are many and varied. It seems to have been a common requirement in the Pueblo country that the kivas should be wholly or partly underground, but the greatest care was bestowed upon their construction and finish; the interior was plastered with a number of coats and was ornamented with markings and symbols in the shape of bars or bands and triangles, which were of a ceremonial, rather than of a decorative origin. Chimney-like structures were used for ventilation, showing that the kivas were occupied permanently by the men. Circular rooms, built and arranged on the same plan, with exceedingly slight variations in size and construction, reappear in every cliff dwelling, except the smallest one.

Ventilation by the introduction of fresh air on a low level, striking on a screen a little distance from the inlet, and being thereby evenly distributed over the whole chamber, is a development in house construction rarely reached by our own civilization. A stone pier at the opening of the ventilator, and between it and the fire, constantly brings into the kiva the fresh air. The entrance is always at the top, and is generally kept open. This makes a draft which carries off the foul air from below, which would be an absolute necessity, for the men and boys are alawys congregated in the kivas in great numbers, and make it their sleeping place.

.3 The number of storage cists found near the cliff dwellings, prove that they were permanently occupied. These have been referred to by all the explorers, from Jackson and Holmes down to Mindeleff and Matthews. Mr. Jackson speaks of store houses which were placed high up in the cliffs in the Mancos Cañon, above the cliff dwelling called the "Sixteen-windowed House." These were reached by climbing the side of the cliff at one end of the ledge, and then passing from one store house to another. There were remains of corn and beans and other products in these store rooms, so that one is called the fire room; another, the bean room, and another, the corn room.

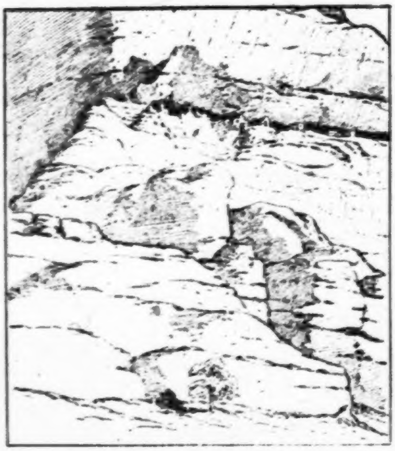
The people dwelt in the rooms which were built on the lower ledge, and had their separate apartments, which extended back to the rock and were lighted by the windows in front. A round room, with a narrow passage-way, or flue, near the floor, was undoubtedly the estufa furnished with a ventilator, after the plan of other estufas in the region. The only court in this village was at the end of the ledge, and just below the stairway which led up to the store rooms. Running water was found within a few yards of this group of houses.


STORAGE CIST.

Mr. Jackson speaks, also, of the store rooms or cists scattered along the cliffs near the Montezuma and the Hovenweep. He calls them cubby holes and rock shelters, and speaks of them as occurring in all sorts of positions, from the level of the valley to the height of over 100 feet, and from the smallest kind of a cache, not larger than a bushel basket, to buildings that sheltered several families. Some of them were little, walled-up, circular orifices in the rock, generally inaccessible; but many were approached by steps, or rather small holes, cut in the rock so as to enable the climber to ascend, as if by a ladder. The steps leading up to them show that they were considerably used, and were probably resorted to by the house wives as they needed the products which were stored away. In one of the cave dwellings, the skeleton of a human being, nearly covered with the excrement of small animals, dust and other rubbish, which covered the floor a foot deep, was found.

Mr. F. H. Chapin speaks of the store rooms back of the line of houses in Cliff Palace, and of the burial places which were in the niches of the rocks, showing that the people were so permanently settled, as to bury their deadin the midst of their houses. He speaks, also, of a little isolated room, with a single window for an entrance, which was situated on the upper ledge of Acowitz Cañon. It is probable that this was used both as a store room and a look-out station. It was very difficult to reach and was perched in a little cleft, high up in the side of the cliff, where it constituted one of a second group of buildings.

Mr. Mindeleff mentions the store rooms in the Cañon de Chelly. There was a group of ruins located on a narrow bench 300 feet above the cañon bottom; access to the upper ledge was exceedingly difficult, requiring a climb of almost vertical rock over forty feet. At the northern end of the upper ledge, there are five small cells, occupying its whole width, whose front wall follows the winding ledge. These cells could hardly have been used as habitations. There was one room which measured fifteen by five feet, which may have been employed for the storage of water.



CLIFF VILLAGE ON DEL MUERTO.

He also speaks of the reservoir for the storage of water, as situated at the bend of the river and directly above the stream, and suggests that water may have been drawn up from the stream and poured into the reservoir at a dry time. It constitutes a part of a cliff village.

A granary in the rocks is described, which was reached by a narrow passage-way about 2½ feet wide, and was protected by two small rooms on one side, and by the village itself, on the other. The interior forms a convenient dry, airy space.

Another village on the Del Muerto is situated on a narrow ledge nearly 400 feet above the stream. It was almost inaccessible, but was reached by climbing up the rock by aid of hand and foot holes. The entrance to the village was guarded by a room whose walls were pierced by oblique loop holes for the discharge of arrows. The site commands an extensive outlook over the cañon bottom, including several areas of cultivable land. Immediately below are the remains of a large settlement, and nearby, a number of small settlements, connected with it.*

4. Another proof that the cliff dwellings were permanent resdences, is found in the fact that bodies were buried and relics deposited in such great numbers.

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* Sixteenth Annual Report Ethnological Bureau, p. 132; see also cut.

Nordenksjold discovered bodies of children in Johnson Cañon and at Spruce Tree House. In a little room there were five bodies with arrows lying across their heads, and between the skeletons four bows. One skeleton lay on the top of a mat, with a bow on one side and a mug and a basket on the other; a pair of mocassins on the feet, and some feather cloth under the head. After taking up the bodies, a large mat was discovered covering the floor, and below the mat, a skeleton with a medicine-stick and two prairie-dog-skin pouches. This skeleton was covered with a willow mat, made of grass, and under the grass mat, one of feather cloth; after that, a buck-skin jacket with a fringe.

Mr. Nordenksjold also speaks of the wooden implements used for planting sticks; of the baskets and pottery vessels used for holding grain; of the textile fabrics which were made from cotton; of the mats and sandals made from corn leaves; of the ears of corn found in the ruins; of the corn meal, also discovered in small quantities, and of the store houses where the corn was stored, and other tokens. He says: "The most common implement is a wooden stick, 1.4 metre long, pointed like a sword at one end, and often furnished with a round knob at the other. This instrument closely resembles the stick used in planting maize. ? With it, a hole about fifty centimetres deep is made in the ground, and a kernel of the maize is then dropped into the hole. The implements found in the cliff dwellings were probably used in the same manner. They also served as spades of a general character.

"A circumstance which bears out the conjecture that these tools were used as planting sticks, is that the custom prevailed, both among the Cliff-Dwellers and the Moquis, of laying beside the corpse at the time of burial, one of these planting sticks, considering that the deceased ought not to enter upon his new existence without this important adjunct to the planting of maize. It seems that the same idea prevailed among the Cliff-Dwellers.

"As a rule, the maize of the Cliff-Dwellers is smaller in ear than that cultivated by the Indians at the present day. It was probably grown, partly on the mesa, and partly on the more gradual slopes, which were sometimes terraced. After the harvest, the corn was stored in rooms set apart for this purpose in the bottom story of the cliff dwelling."

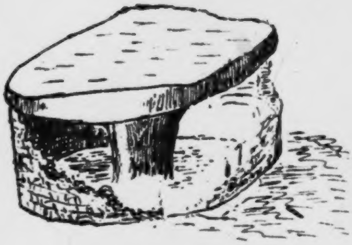
Numerous fragments of cotton cloth have been found. The cotton plant was probably cultivated by the cliff people, at least in some localities, for cotton seeds have been found in the cliff dwellings of southern Utah, and cotton garments are also found. A mat, composed of withes split in two, held by the stiff cords of yucca, was found wrapped around a corpse in a grave at Step House; a woven band, used in carrying bundles, made of yucca and cotton, was found in Ruin No. 11, and a double-woven band in an estufas in Ruin No. 12; pieces of cotton cloth, with pattern woven in threads of dark brown color, was found in Mug House; a large basket of yucca in two different colors was found in Spruce Tree House; a willow basket, tightly plaited, of osiers, was found in a grave at Step House, and a basket, coated on the outside with some substance to make it water-tight, was found at the same place.

Marco de Nueva in 1539, was told by the Indians of a great plain of about thirty days' travel, inhabited by people living in large towns built of stone and lime, who wore cotton garments, and who possessed an abundance of gold, turquoises and emeralds. This shows that cotton was cultivated in prehistoric times even by the natives of America, and that agriculture of various kinds was practiced by the Pueblos.

.5 The use of shrines by the Cliff-Dwellers is evidence that they made permanent homes in the canyons, and depended upon agriculture for subsistence. Shrines are very common among the Pueblos, and are there attended by peculiar symbols, such as the symbol of the sun and moon, the suastika, the Nile key, the Egyptian tau, the Greek fret, and the coil. Dr. J. Walter Fewkes has recently discovered a large quantity of pottery, which contains some new and rare symbols; among them, the bird figure and reptilian figures, cloud emblems, spiral designs, arrows of a peculiar type, a sun emblem with white rays projecting from a black circle, the rays being arranged in a spiral form, but having notches in them, making them resemble notched plumes. This might be called the whirling sun. These symbols are supposed

SHRINE IN SHAPE OF HUMAN SKULL.

by some to have been introduced among the Pueblos later than the time of the Cliff-Dwellers. There is a food bowl with the figure of a masked dancer, among them. This food bowl was made of red ware with black lines. The pottery was taken from a ruin near the Gila River, at the pueblo Viego; also at Four Mile Ruin, and near Taylor and Pine Dale, similar to that of the Salado River, near Tempe. A sacrificial cave was also discovered in the Graham Mountain, which was full of prayer emblems. Fragments of basketry were found with prayer sticks. The symbols on the decorated pottery of the pueblo Viego ruins are the same as that further down the Gila, and remotely related to the Little Colorado and its tributaries.


TOAD STOOL SHRINE.

The shrine and rock inscriptions of the Cliff-Dwellers* are different from any that have been found in the Pueblo region. They are generally placed underneath the huge bowlders which are common in the valleys, and are large enough to afford a shelter underneath them, as well as for a lookout or tower on the summit. Mr. Gunckel has described several of them, one of which had a wall built up around the base of the boulder, inside of which was space enough for quite an assembly of devotees, the interior ot the shrines being protected by shelving rock, which projectes over the shelter, making a dark space which was regarded as full of mystery to the people on account of its shadows. One boulder, which was used as a shrine, was in the shape of an immense skull, with holes in the rock, representing eyes. This was called Boulder Castle and is situated two miles from the mouth of McElmo, and half a mile from the river. The rock is fifty feet high, in the midst of a wild, picturesque region, surrounded on all sides by immense sandstone boulders; ruins were on the top of the rock which, possibly, may have been used as a look out. The room below sloped back to a few inches in height. Back of the boulder, was an inclosure seven metres each way. Pictographs, consisting of human feet, circles, animals and dumb bell figures, were found. Above Boulder Castle was a large cluster of ruined houses and towers, some of them round; others, square, and in the valley were springs with an abundant supply of water. The pictographs contained the same symbols which are found among the ruins of the south—circles, crescents, human hands, serpents figures, the suastika, and the coil.

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* The shrines here are more elaborate than those among the Pueblos further south, thongh they remind us of the shrine and sacred spring ot the Zunis.

Another shrine described by Mr. Gunckel was a sandstone rock in the shape of a toad stool; flat on the top, the shaft below. A wall has been constructed around this shaft, leaving an open space, which may have been used as a shrine, or as a double circle, or as a place of religious ceremony. This shelter cave is situated in Ruin Cañon, fourteen miles from McElmo.

6. The erection of towers and cliff dwellings in the neighborhood of springs and lakes, is another evidence that the cliff dwellings were permanent abodes. Major Powell has described ruins situated on the brink of Glen Cañon, in the midst of the rocks of the Grand Colorado Cañon. Here was a tower which gave a commanding outlook, and a building in the shape of the letter **L**.

MONTEZUMA CASTLE.

The most remarkable tower, is the one at Montezuma Castle, first described by Dr. W. H. Hoffman, and referred to by many others. He says, that the Cliff-Dwellers occupied this valley for raising crops and for agricultural purposes, seems evident from the fact that it is the only favorable district found within a convenient distance of the cliff remains, and also the nearest patch of irrigable land upon which we find any traces of former occupation.

An interesting place and one which was probably used as a permanent home, is that called Montezuma Wells, on account of the sunken well or lake which exists there. It is in the same region as Montezuma Castle, and has been regarded as an agricultural settlement; the houses which were here, being placed in the sides of the cliffs and near the lake or pond of clear water, for the sake of convenience. It was, however, near agricultural land, and only separated from the land by a narrow ridge of limestone, through which there was an opening which made a convenient gateway to the fields. Nowhere else, is there such a strange setting of a cliff village as here, and yet there is every reason to believe that it was a permanent settlement.

Mr. Lummis says: "This sudden well in the gray limestone is about eighty feet deep, from rim to water level, and 200 yards in diameter. The walls are apparently as circular as man could have carved them. The tar-black lakelet at the bottom is of an unknown depth—a 380-foot line at my last visit (1891) having failed to find bottom. On the side where Beaver Creek has eaten into the hill, there is left only the thinnest of rims to hold the 'well.' Yet between the creek and the 'well,' on this knife-edge rim of limestone, are huddled the ruins of one of the prehistoric Pueblo fort houses. A crumbled talus of masonry, with its tallest remaining walls not to exceed eight feet, it is yet one of the most suggestive types of the ancient régime when the few first American farmers and home makers made head against the outnumbering vagrant savages and niggard wilderness. Below, along the pinched creek, were their tiny irrigated farms; up here, on the ridge-pole between two precipices was their communal town of several stories; and commanded by it, their last retreat. The fort house absolutely controlled the only reasonable entrance to the well; the only other path down to the lake's edge, could be held by boys against an enemy." *

The remarkable specimens of cliff villages, or cave houses, are those discovered by Mr. Carl Lumholtz. They were found in the midst of the mountains of Mexico These caves are situated on the Piedras Verdes, 6,850 feet above the sea. He says:

> They contain groups of houses, or small villages, and the houses are splendidly made of porphry and show that the inhabitants had attained a comparatively high culture. The dwellings were sometimes three stories in height, with small windows and doors made in the form of a cross or the letter T, and occasionally there were stone stair cases. The relics show that these people cultivated maize, beans and cotton, and knew the use of indigo.
>
> The caves, which number about fifty in a stretch of twenty miles, are from 100 to 200 feet above the bottom of the canyon, and the largest is some fifty feet high. At the entrance of one of the cave villages we were astonished to come upon a huge vessel made like an *olla*, or water jar, twelve feet high and twelve feet in diameter. The sides of it were eight inches in thickness and as hard as cement, the frame being made of straw ropes, coiled and plastered outside and inside with porphy pulp. At the bottom was a three-foot high entrance, through which a person could crawl in; the top, which was only three feet wide, was also open. It made a marvellous impression, looking at a distance like a huge balloon, and seen nearby, it was as fresh as if made a week before. I believe it was for the storage of maize. In one of the other caves we met with three ruins of similar, but smaller vessels, their circular bases only being left. There were built, also, some reservoirs for grain, dug down in the bottom of the caves. In the background of this cave, were the houses built in complete darkness. In the deepest caves the houses were built at the entrance, while in the smaller ones the houses were found at the back. It is to be noted that all the caves are natural.†

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* "Montezuma's Well in Land of Sunshine," by Chas. F. Lummis.

† "Report of Explorations in Northern Mexico," by Carl Lumholtz. Published in Bulletin American Geographical Society, September 30, 1891.

Mr. Lumholtz speaks of the Tarahumari, a wild people, who are scarcely raised above the Troglodytes in their social condition. He says:

> They are much inferior to the Cliff Dwellers; their pottery is exceedingly crude, and they are utterly devoid of the architectural skill exhibited in the remarkable structures of the northern Cliff-Dwellers. These caves are fitted up as their houses, with the same utensils, grinding stones, baskets and jars; the fires in the middle of the cave. The store houses, so necessary to the household life for storing corn and clothing, is never missing in the caves. They are built of stone and adobe along the inner walls, and serve as big closets. These store houses are quite an institution. They are found everywhere in remote places, perched generally on high rocks or boulders. Very often caves, difficult of access and walled-in, are used as store houses.
>
> The Tarahumaris, according to their own tradition, came from the north and east, the same country as the Apaches.[*]

III. The most remarkable thing about the agriculture of the Pueblos and, perhaps, the Cliff-Dwellers, is the Snake Dance and its connection with the rain. It is not generally known that the real purpose and intent of this dance is, to secure rain, and that it is a prayer to the rain gods, who dwell in the clouds, and are symbolized by lightning and the clouds which assume the shape of serpents. To the white man this seems far fetched and purely imaginary, but to the aboriginal mind, there was always an unconscious habit of associating supernatural beings with the natural, making the material object a symbol of the immaterial force. The natural powers and the supernatural creatures were closely related. Their imagination was so active and vivid, that they recognized resemblances which would escape the attention of ordinary minds, and their superstition changed the resemblance into realities.

There were three ways in which they expressed their beliefs and made known their wants; all of which might be called prayers. The first was by a symbolic picture; the second was by an image decorated with various symbols and ornaments, and the third was by a sacred drama in which the divinities were personified. Under the first head may be embraced the sand paintings or mosaics, in which the rain clouds, the lightning, the sky, the sun and the nature powers were all represented. The sacred screens also represented the same elements. It will be noticed that corn is also represented in connection with these screens and altars. Among the Navajos, not only corn, but beans, vines and other plants are represented as under the care of certain divinities.

Under the second head, must be included the great number of dolls which abound among the Pueblos, and are supposed to have a remarkable significance. They are decorated with feathers, which symbolize the clouds, and have others symbols of the rains and nature powers.

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[*] "American Cave-Dwellers; the Tarahumaris of the Sierra Madre," by Carl Lumholtz u blished in the Bulletin American Geographical Society, September 30, 1894.

THE SNAKE DANCE AT ORAIBI.

THE SNAKE DANCE AT ORAIBI.

Under the third head, may be embraced all the sacred dramas in which are the sacred myths and legends which have been inherited and are embodied in elaborate ceremonies, and are personified by men, women and children, who take part in the dances and songs.

The myth which lies back of the so-called Snake Dance, is one that relates to some event in the early history of the people, and is connected with the scarcity of rain. It is a myth, which is told by the Tusayans in reference to their ancestors, but it also prevails among other tribes; and it is not at all unlikely that the Cliff-Dwellers had a similar myth and a similar custom, for there are rock-inscriptions near the cliff dwellings, which represent serpents and other symbols, closely resembling those of the Pueblos.

Mr J. Walter Fewkes, who is the best authority on the subject, after long study, concludes that the Snake Dance, which he saw in three pueblos—Walpi, Oraibi and Hano,—was not only a rain ceremony, a pantomime of prayer for rain; but was also connected with corn worship, especially as the symbols of corn are present on every side. No clew could be obtained in regard to the deity addressed. There are, however, figures of rain clouds, which, so far as they go, prove that rain worship was one of the prominent features, but the personages in the drama, especially the girls in the Flute ceremony, and the Snake Maiden in the Tusayan ritual, represent the Corn or Germ Maids; the images also represent the same. The girls have figures of corn painted on their body, and images which are highly elaborated into dolls are called "calako," corn maids. These dolls have characteristic symbols on their

SNAKE DANCE AT WALPI.

cheeks, the same rain cloud ornament on the head, an ear of corn on the forehead, eyes of different colors, and painted chin. The Snake Maid, in the dramatization, holds a bowl of stalks of corn and bean vines. The Flute girls carry corn pahos on which corn is depicted. The entrance of the Flute girls into the town on the ninth day of the Flute ceremony, corresponds, according to legends, to the entrance of the Corn maids.

By a similar course of reasoning, Mr. Fewkes concludes that the Walpi Snake Dance perhaps represents the same corn worship, combined with rain worship. This is celebrated by men, who carry reptiles in their mouths; but the Walpi "Lalakonti" is a sky god. He is a renowned hero, appearing in different disguises, and is called White Corn, and was one of seven brothers who sought and found a maiden in a cave. She became his bride It was noticed that her prayers for rain were efficacious. She conceived; in a tempest a child was born. and she erected the rain cloud altar in her native home. White Corn and his wife retired to a distant mesa, where she gave birth to reptiles and disappeared.

The description of these dances hase been given by Mr. J. Walter Fewkes, at great length. There is a story connected with them, and it is as follows:

> A youth, under guidance of Spider-woman, visited the underworld and had many adventures with several mystic beings. He entered a room where people were clothed in snake skins, and was initiated into mysterious ceremonies, in which he learned prayers which bring corn and rain. He received two maidens, associated with clouds, who knew the songs and prayers efficacious to bring rains. He carried them to the upperworld to his own people. One, the Snake-woman. he married; the other became the bride of the Flute-youth. His wife gave birth to reptiles; he left them and their mother, and migrated to another country.*

The main points in all the stories are, when compared, as follows:

> A culture hero sought a mystic land blessed with abundance, and brought from that favored place, the Corn and Rain Maids, whose worship or prayer was powerful in bringing food and rain. Stripped of pathetic embellishment, the legend has a practical interpretation. The two necessities, corn and rain, failed the ancient Hopi at some early epoch in their history, so that they were in danger of starvation, when one of their number, furnished with prayer offerings as sacrifices, sought other people who knew prayers, songs and rites to bring the desired gifts. In order to learn these charms, he was initiated into their priesthood by this foreign people, and to make that adoption complete. married one of their maids, and, to save his brethren. he brought his bride and offspring to live with his own people. His children were like those of her family (the Snake clan), and unlike his, and hence trouble arose between them. The mother returned to her own land, and the father also sought a new home. Their children inherited the the prayers and songs which bring corn and rain, and they were ancestors of the present Snake people.

So it is, I believe, that every year, when the proper time comes, the men of the Snake family, who have been initiated into the Snake fraternity, and the descendants to whom these prayers, songs and fetishes were transmitted, assemble, and in order that their work may resemble the ancestral, and be more efficacious, they gather the reptiles from the fields; dance with them, as of old; personating their mother, the Corn and Mist Maids, in the kiva dramatization, and at the close of the dance, say their prayers in hearing of the reptiles, that they may repeat them to higher deities.

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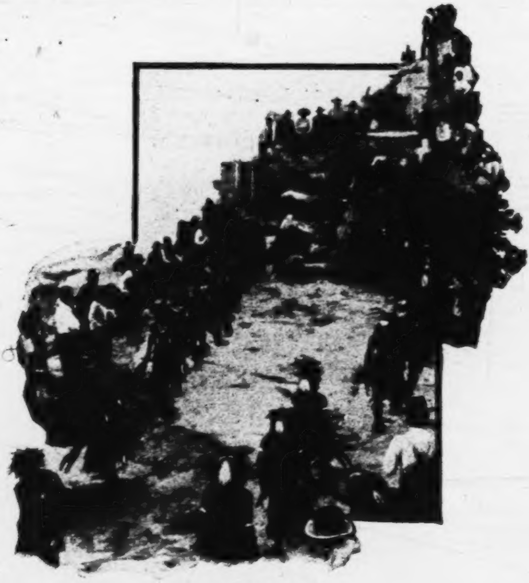
* "Tusayan Snake Ceremonies," by Jesse Walter Fewkes. Annual Report Bureau of Ethnology, 1894-95; p. 303.

While this theory of the Snake Dance is plausible, it offers no explanation of why reptiles are carried in the mouths of the priests. It can readily be seen that it pre-supposes that they dance in the plaza with the priests, but why are they not simply carried in the hands? For this, I confess, I have no adequate explanation; but the fact that they are carried in the hands as well as in the mouth at Oraibi is suggestive, especially if the Oraibi is the most primitive.

Some daring priest, for a sensation, still holding the reptile in this way, put its neck in his mouth, possibly to prevent its coiling and hiding its size. That method was startling, and was adopted by all, a condition which persists at Oraibi.



THE SNAKE DANCE.

The public exhibition called the Antelope Dance, on the afternoon of the eighth day, is evidently connected with corn celebrations, for at that time a wad of cornstalks and melon vines, instead of the reptiles, is carried in the mouths of the priests, as on the following day.

The episode in the Snake kiva at Walpi, when the bear and puma personators carried cornstalks in their mouths and moved them before the faces of the men, women and children, has probably the same significance. The pinches of different colored sand which were taken from the sand picture of the antelopes before it was dismantled, were carried to the cornfields, as symbolic of the different colored corn, they hoped their prayers would bring, conformably to the legend of its efficacy in that direction

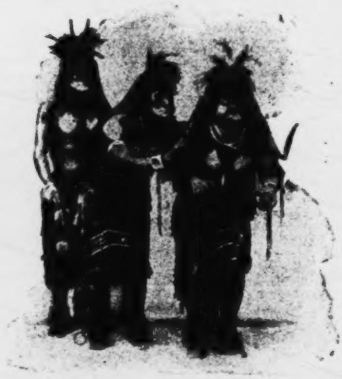
The Snake Dance is an elaborate prayer for rain, in which the reptiles are gathered from the fields, intrusted with the prayers of the people, and then given their liberty, to bear these petitions to the divinities who can bring the blessings of copious rains to the parched and arid farms of the Hopis. It is, also, a dramatization of an ancient half mythic, half historic legend dealing with the origin and migration of the two fraternities which celebrate it, and by transmission through unnumbered generations of priests has become conventionalized to a degree, and possibly the actors themselves could not now explain the significance of every detail of the ritual.

The seriousness and gravity with which the ceremonials are conducted is very impressive. The ceremonies are religious and make up the complicated worship of the people of Tusayan. Even a visitor, bent on sightseeing, will be impressed with the seriousness of the Indian dancers, and the evidence of deep feeling—perhaps it should be called devotion—in the onlookers. Not only in the sombre Snake Dance, but in every other ceremony of Tusayan, the actors are inspired by one purpose, and that is to persuade the gods to give rain and abundant crops. So the birds that fly, the reptiles that crawl, are made messengers to the great nature gods with petitions; and the different ancestors and people in the underworld are notified that the ceremony is going on, that they, too, may give their aid. The amount of detail connected with the observance of one of the ceremonies is almost beyond belief, and, being carried on in the dark kiva, has rarely been witnessed by others than the initiated priests.

THE SNAKE DANCE.

## The following is the description of the Snake Dance :

The grand entrance of the Snake priests is dramatic to the last degree. With majestic strides they hasten into the plaza, every attitude full of energy and fierce determined purpose. The costume of the priests of the sister society of Antelopes is gay in comparison with that of the Snake priests. Their bodies rubbed with red paint, their chins blackened and outlined with a white stripe, their dark red kilts and moccasins, their barbaric ornaments, give the Snake priests a most sombre and diabolical appearance. Around the plaza, by a wider circuit than the Antelopes, they go, striking the *sipapu* plank with the foot, and finally leaping upon it with wild gestures. Four times the circuit is made; then a line is formed facing the line of the Antelopes, who cease shaking their rattles, which simulate the warning note of the rattle snake. A moment's pause and the rattles begin again, and a deep, humming chant accompanies them. The priests sway from side to side, sweeping their eagle-feather snake whips toward the ground; the song grows louder and the lines sway backward and forward toward each other, like two long undulating serpents. The bearer of the medicine walks back and forth between the lines and sprinkles the charm liquid to the compass points.



CARRIER, HUGGER AND GATHERER.

All at once the Snake line breaks up into groups of three, composed of the "carrier" and two attendants. The song becomes more animated and the groups dance, or rather hop, around in a circle in front of the *kisi*; one attendant (the "hugger") placing his arm over the shoulder of the "carrier," and the other (the "gatherer") walking behind. In all this stir and excitement it has been rather difficult to see why the "carrier" dropped on his knees in front of the *kisi*; a moment later, he is seen to rise with a squirming snake, which he places midway in his mouth, and the trio dance around the circle, followed by other trios bearing hideous snakes. The "hugger" waves his feather wand before the snake to attract its attention, but the reptile inquiringly thrusts its head against the "carrier's" breast and cheeks and twists its body into knots and coils. On come the demoniacal groups, to music, now deep and resonant, and now rising to a frenzied pitch, accompanied by the unceasing sibilant rattles of the Antelope chorus. Four times around, and the "carrier" opens his mouth and drops the snake to the ground, and the "gatherer" dextrously picks it up, adding in the same manner, from time to time, other snakes, till he may have quite a bundle composed of rattle snakes, bull snakes and arrow snakes. The bull snakes are large and showy, and impressive out of proportion to their harmfulness. When all the snakes have been duly danced around the ring, and the nerve tension is at its highest pitch, there is a pause; the old priest advances to an open place and sprinkles sacred meal on the ground, out-lining a ring with the six compass points, while the snake priests gather around. At a given signal, the snakes are thrown on the meal drawing and a wild scramble for them ensues, amid a rain of spittle from the spectators on the walls above. Only an instant and the priests start up, each with one or more snakes; away they dart for the trail to carry the rain-bringing messengers to their native hiding places. They dash down the mesa and reappear far out on the trails below, running like the wind with their grewsome burdens. The Antelope priests next march gravely around the plaza four times, thumping the sunken plank, and file out to their kiva. The ceremony is done.*

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* "The Maki Snake Dance," by Walter Hough, Ph. D. Published by the Passenger Department of the Santa Fe Route.

# CHAPTER XVII.

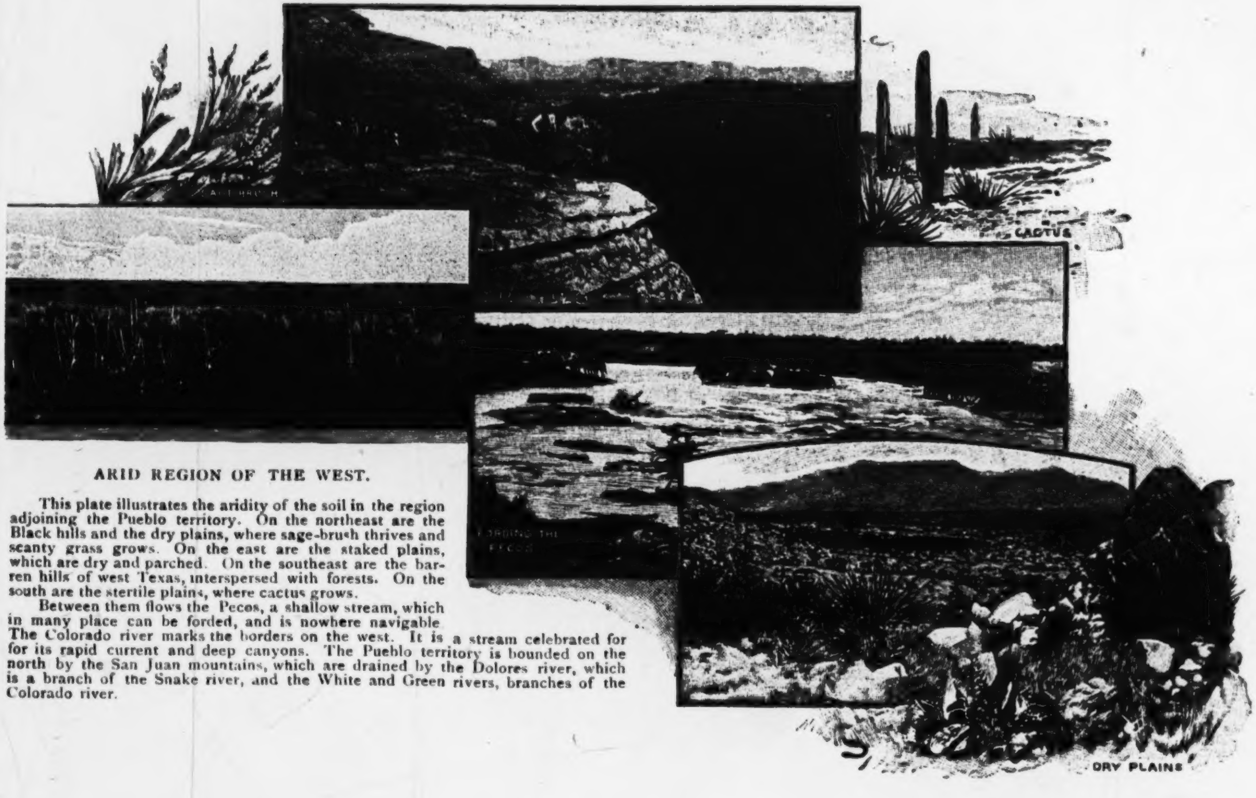
## PREHISTORIC IRRIGATION.

We spoke in the last chapter of the agriculture which was practiced by the Cliff-Dwellers, and its effect upon their social condition and village life. We shall treat of the same subject in this chapter, but shall illustrate it by the irrigating contrivances which were especially useful to the Pueblos and to the tribes south and west of the Cliff-Dwellers.

I. Our first effort will be to show the connection between the irrigation practised by the Pueblos and their social condition. There was, perhaps, no influence so strong as this. It affected not only their social status, but their form of government, their style of architecture, their art, and everything which was important. It secured to them subsistence in the midst of an arid region. It brought about a permanence of settlement. It concentrated the people into large communities. The most notable advantage was that irrigation from the very beginning gave the people a strength which enabled them to overcome all the difficulties in their way, and to hold their position among the peoples of that region.

1. It seems strange that in this remote region and amid the unfavorable surroundings, that the Pueblos should have developed so thoroughly and kept themselves up to the high grade which they had reached. In the midst of an arid region, with a climate which seemed to be always unfavorable to agriculture; surrounded by mountains which kept the clouds from gathering, with rocks and mesas whose height was forbidding, with streams which had through countless ages worn deep channels in the rocks and now flowed at immense distances below the surface, with everything unfavorable, they presented at the time of the discovery a form of society and a mode of life which were totally unlike any other upon the face of the earth. How do we account for this?

It is a common opinion that man is everywhere influenced by his surroundings, and whatever grade of civilization he has reached has been owing to this circumstance. Here, however, there seems to be an exception, for, if any people were ever placed in unfavorable surroundings, it was the Pueblos. There were tribes in their midst, who remained in the wild state, and who continued the hunter-life, roaming over the hill tops and through the valleys as nomads; building their rude huts, which they easily took down and removed to new places; but this people from an early date led a peaceful sedentary life, built their many-storied houses, were organized into villages, made



## ARID REGION OF THE WEST.

This plate illustrates the aridity of the soil in the region adjoining the Pueblo territory. On the northeast are the Black hills and the dry plains, where sage-brush thrives and scanty grass grows. On the east are the staked plains, which are dry and parched. On the southeast are the barren hills of west Texas, interspersed with forests. On the south are the sterile plains, where cactus grows.

Between them flows the Pecos, a shallow stream, which in many place can be forded, and is nowhere navigable The Colorado river marks the borders on the west. It is a stream celebrated for for its rapid current and deep canyons. The Pueblo territory is bounded on the north by the San Juan mountains, which are drained by the Dolores river, which is a branch of the Snake river, and the White and Green rivers, branches of the Colorado river.

their houses their castles, and made permanent homes, and in all respects presented a contrast to their enemies, who were constantly besieging them. Even when driven to the cliffs, and compelled to make their homes high up in the rocks, they maintained their superiority and kept up their grade of culture, refusing to yield to their enemies.

There were other tribes far to the east, who had occupied the Mississippi valley from time immemorial, and amid the abundance which was secured from the soil, and the ease with which subsistence was gained from the forest, had never reached any such a grade of progress, certainly never exhibited any such social condition. There were tribes to the west, who in the midst of the wonderful productiveness of the California fields and forests, were in the most abject state and were the lowest of the low. The only people who ever reached a higher grade than the Pueblos, were those who were situated in the southwest, and amid their peculiar surroundings had grown into partially civilized and well-organized nations. We look upon this people, whom we call the Pueblos, with a constant surprise, and wonder how it was that they should have become so conspicuous among their fellows.

Was this owing to their inheritance and because they belonged to a superior stock of people, or was it because under unfavorable circumstances, they were forced into a mode of life and compelled to choose an occupation which unconsciously resulted in their improvement and social progress? It is plain that the Pueblo culture was a child of adversity, and this, of itself, was the cause of their superiority, rather than any constitutional tendency or their inherited quality. As we study their sluggish nature and their ease-loving character, we are convinced that they were no more heroic than others. The only key to the solution of the problem, which we can discover, is the one which is found in their employment: It was agriculture by means of irrigation. This was a necessity, but it was one which brought its own reward; a misfortune which brought a fortune in return. Those who are studying sociological problems, may possibly learn a lesson from this. The employments of the people have as much to do with the peculiar condition of society as any one cause, and the social distinctions are always, even in modern times, the result of employment.

2. Let us consider for a moment the situation. We have already spoken of the great plateau on which the pueblos are situated, as being very peculiar in its character, and as having a great effect upon the architecture which appears here. The buildings were often imitative of the rocks, and the terraced roofs resembled those found in the sides of the mesas. We have spoken, also, of the aridity of the soil and the absolute necessity for irrigation on account of it. We have also referred to the religious customs of the people, and especially those customs which grew out of their desire for rain; their ceremonies all concentrated upon this thought, and their sacred

dramas were often personifications of the rain cloud. There is, however, one point which we desire to accentuate, and that is the resemblance between the Pueblos and those nations at the east, which so early arose to prominence because of their sedentary life and agricultural condition, and especially because they were able to overcome the difficulties with which they were surrounded.

3. We see the influence of agriculture, in the state of society which prevailed, for it raised the entire people to a higher plane. Notwithstanding the difference of their situation, the diversity of their language, the separation of the tribes, and the distances between their villages, their unity was complete, because of the fact that they were agriculturists, rather than hunters, and because in their agriculture they depended upon irrigation. They had to combine to build their irrigating ditches, and to keep them in repair; and were led by this to continue the same sedentary life which they had begun, and to remain in the same region where they had first built their communistic houses, and perpetuate the same government which they had inherited from their fathers, as well as to keep up the religious practices which their ancestors observed before them. We can not say that it was an ethnic type which was perpetuated, nor an ethnic descent which produced either their style of architecture or their mode of life, though their social organization, especially their clan-life, may be owing to these causes.

PUEBLO AT HALONA.*

The radical difference between them and the tribes which surrounded them, was not in language or descent, but in employment. This is the thought which we desire to illustrate. The village life and the agricultural pursuits of the Pueblos are the chief causes which resulted in their high grade of civilization. This is a thought which has impressed other minds, and has often been dwelt upon by other authors. Mr. Morgan, who is a great authority upon the social life of the American aborigines and has written one of the best books on ancient society, was impressed by the fact that the Pueblos reached so high a grade of civilization, and that they stood next to the civilized people who dwelt in the southwest provinces, and who were the builders of the ancient cities, many of which are now in ruins. He ascribes it largely to their village life and their social organizations, but recognizes agriculture, also, as one of the factors. He says:

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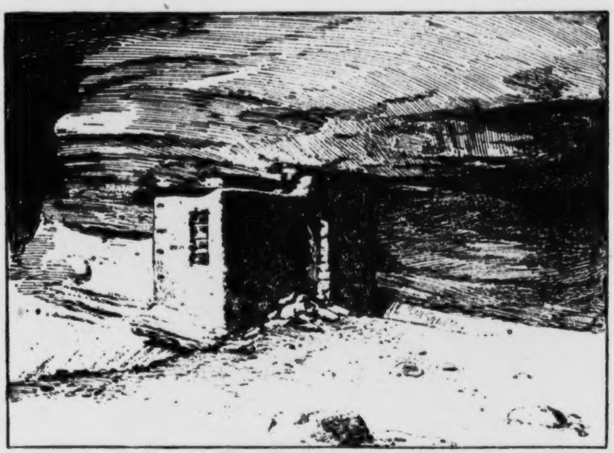
*The arrangement of dwellings about a court, characteristic of the ancient Pueblos, is illustrated by the cut The kiva is in the centre of the court, which is well drained;



STORAGE HOUSE IN CANYON DEL MUERTO.*

> The Yucatan and Central American Indians were, in their architecture, in advance of the remaining aborigines of North America. Next to them, probably, were the Aztecs, and some few tribes southward. Holding the third position, though not far behind, were the Village Indians of New Mexico. They all alike depended upon horticulture for subsistence, and cultivated by irrigation; cotton being superadded to the maize, beans, squashes, and tobacco, cultivated by the northern tribes. Their houses, with those previously described, represent together an original indigenous architecture, which, with its diversities, sprang out of their necessities. Its fundamental communal type, is found not less clearly in the houses about to be described, and in the so-called palace of Palenque, than in the long house of the Iroquois. An examination of the plan of the structures in New Mexico and Central America will tend to establish the truth of this proposition.
>
> At the time of Coronado's expedition to capture the Seven Cities of Cibola, so-called in the "Relations" of the period, the aborigines of New Mexico manufactured earthen vessels of large size and excellent workman-

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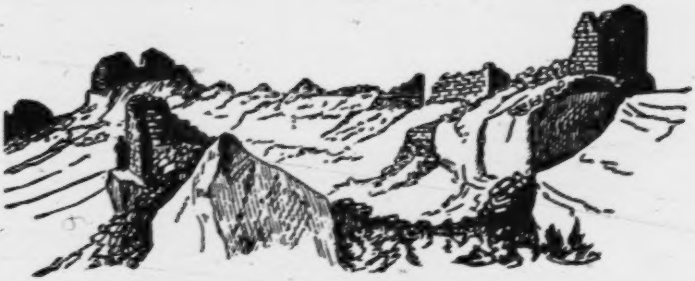
*Storage houses, like the one represented in the cut, are common on the Rio de Chelly. The doors are large and wide to admit the carrying of corn stalks into them, as well as storing the corn. Such store houses were sometimes covered with plaster, imitating the color of the cliffs, for the purpose of concealment.

ship; wove cotton fabrics with spun thread; cultivated irrigated gardens; were armed with bows, arrows, and shields; wore deer-skins and buffalo-robes, and also cotton mantles, as external garments, and had domesticated the wild turkey.

What was true of the Cibolans in this respect, was doubtless true of the sedentary Indians in general. Each pueblo was an independent organization under a council of chiefs, except as several contiguous pueblos, speaking dialects of the same language, were confederated for mutual protection, of which the seven Cibolan pueblos, situated, probably, in the valley of the Rio Chaco, within an extent of twelve miles, afford a fair example. The degree of their advancement is more conspicuously shown in their house architecture. The supposition is reasonable that the Village Indians north of Mexico had attained their highest culture and development where these structures are found. They are similar in style and plan to the present occupied pueblos in New Mexico, but superior in construction, as stone is superior to adobe, or to cobble stone and mortar. They are also equal, if not superior, in size and in extent of their accomodation, to any Indian pueblos ever constructed in North America. This fact gives additional interest to the ruins which are here to be considered. The finest structures of the Village Indians of New Mexico, and northward of its present boundary line, are found on the San Juan and its tributaries, unoccupied and in ruins. Even the regions in which they are principally situated are not now occupied by this class of Indians, but are roamed over by wild tribes of the Apaches and the Utes.



RUINED PUEBLO ON THE MAC ELMO.

The most conspicuous cluster of the ruined and deserted pueblos are in the canyon or valley of the Rio Chaco. At the period of the highest prosperity the valley of Chaco must have possessed remarkable advantages for subsistence. The plain between the walls of the canyon was between half a mile and a mile in width, but the amount of water now passing through is small. In July, according to Lieutenant Simpson, the running stream was eight feet wide, and a foot and a half deep, at one of the pueblos; while Mr. Jackson found no running water and the valley entirely dry in the month of May, with the exception of pools of water in places and a reservoir of pure water in the rocks at the top of the bluff. The condition of the region is shown by these two statements. During the rainy season in the summer, which is also the season of the growing crops, there is an abundance of water; while in the dry season it is confined to springs, pools, and reservoirs. From the number of pueblos in the valley, indicating a population of several thousand, the gardens within it must have yielded a large amount of subsistence; the climate being favorable to its growth and ripening.*

4. The social organization of the Pueblos was closely con-

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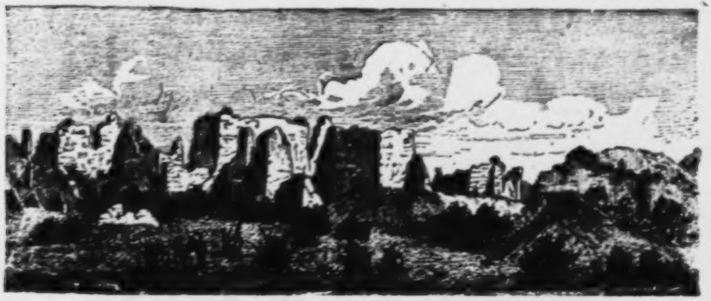
* "Houses and House-life," page 171.

nected with their employment, and was almost a necessity under the circumstances. Property rights and titles and ownership in fee simple of land did not prevail in prehistoric times, but was a possessory right, which came from irrigation, and which was almost equal in its advantages. The limitations upon its alienation to an Indian from another tribe, or to a white man, did not lie in the absence of written titles or conveyances of land, but in the necessities of the case. There was no power to alienate an irrigating ditch, and there would be no value to the land where the ditch could not be kept up. "The ideas of the people respecting the ownership or the absolute title to land, with power to alienate to anyone else, were entirely above their conception of property and its uses." The occupation of a certain district was a right in itself, and was title enough. The inheritance was not that of children from father and mother, but of a tribe from its ancestry, and from those who built the village to those who continued to live in it. The same is true with respect to irrigating ditches, and even in respect to the sections of the village garden. There was a social organization which secured this result.



CASAS GRANDES IN SONORA.[*]

The government was composed of the following persons, all of whom, except the first, were elected annually: First, a cacique or principal sachem; second, a governor or alcalde; third, a lieutenant governor; fourth, a war captain, and a lieutenant war captain; fifth, six fiscals or policemen. "The cacique," Mr. Miller says, "has the general control of all the officers in the performance of their duties, transacts the business of the pueblo with the surrounding whites, Indian agents, etc., and imposes reprimands or severer punishments upon delinquents. He is the keeper of the archives of the pueblo; for example, he has in his keeping the United States patent for the tract of four square leagues on which the pueblo stands, which was based upon the Spanish grant of 1689; also deeds of other purchased lands, adjoining the pueblo. He holds his office for life. At his death, the people elect his successor. The cacique may, before his death, name his successor, but the nomination must be ratified by the people, represented by their principal men assembled in estufa." In this cacique may be recognized the sachem of the northern tribes, whose duties were purely of a civil character.*

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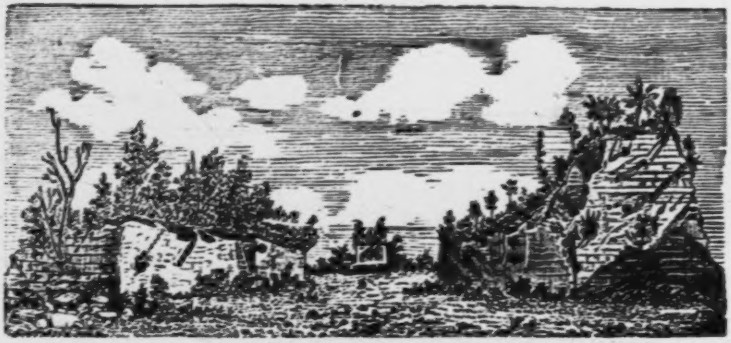
[*] The cut shows the difference between the architecture of the ancient Pueblo tribes in Sonora and those in New Mexico and Colorado, especially in the absence of the court. Both belong to agricultural tribes.

In this simple government we have a fair sample, in substance and in spirit, of the ancient government of New Mexico. Each pueblo was an independent organization, under a council of chiefs, except as several pueblos were confederated for mutual protection. Through all this region there was one mode of house architecture, as there was substantially one mode of life. The country was of that character which would force them to herd together in villages. The very wildness of the region and its aridity required that there should be centres of population, which would constitute the homes of the clans, as well as the defenses of the people. Their subsistence being secured by means of irrigating the soil, they were naturally led to combine together, not only to build, but to keep in repair and defend a canal, as well as to defend their rights to it. It is probable that the people were from an early date sursounded by wild tribes, and were subject to invasions and were compelled to make their permanent homes upon the mesas, or, if they made them in the valleys, to build them in such a way as to repell a sudden attack from a prowling foe. The fact, however, that modern pueblos are at a distance from the streams and out of reach of the floods, shows that the people regarded their safety as important even as their subsistence, the permanent homes being somewhat remote from the valleys, but their farming shelters being in the midst of the fields.



GYMNASIUM AT CHICHEN ITZA, GUATEMALA.†

We see, then, that agriculture, and especially agriculture by irrigation, was a cause, as well as a product of the social advancement of the Pueblos. This is always the case with primitive society. It is a new era to any people when the field begins to yield its products, instead of the forest. The stream may furnish subsistence to wandering tribes, but when it is diverted from its course and carried in artificial channels, and made to irrigate the soil, it becomes another creature. It becomes a handmaid of civilization. It then leads the people unconsciously to fix their habitation by its side, and to remain permanently in their villages. The association of the Pueblo architecture with the art of irrigation, is the most natural thing in the world. Both came from the same causes, and involved the same mode of life. They came from the force of circumstances, but were alike useful to the people.

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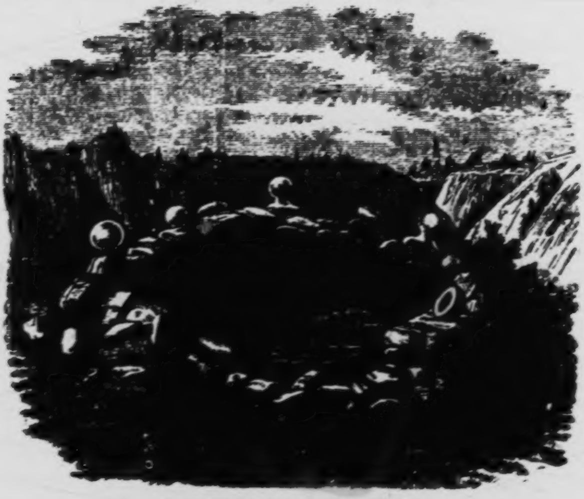
* "Houses and House-life," page 147.

† This cut represents the architecture of the partially-civilized people of Yucatan and Guatemala.

II. Let us turn to the various contrivances which were resorted to by the Pueblos for storing water and for irrigating the soil. These have attracted the attention of all the early explorers, and have also been objects of study by the later expeditions, and are now pretty well known. They show the skill of the people, and they illustrate their grade of culture and throw much light upon their social organization. They are especially interesting, because of the fact that white men have settled in the same region and were obliged to resort to some of the same means of irrigation in order to develop its resources, and provide against its difficulties. It is an old motto that "Necessity is the mother of invention," but the children are sometimes slow to learn the lesson. The Pueblos, however, were the children of Nature, and learned from experience to adapt themselves to Nature in all her varying moods. We do not know how early they began to practice irrigation, nor do we know the time when they began to build their communistic houses; but a fair supposition is that it was after they settled in the region, when they had learned of the scarcity of the water supply and the uncertainty of the rain. They were then led by the force of circumstances to resort to this means of securing subsistence. This probably occurred before the wild tribes entered the region, and, perhaps, before the caves were occupied. Some have supposed that the caves were their first abodes, and that the people gradually grew into the habit of building houses; first out of wood and bark, next out of adobe, and lastly out of stone, and that they in the meantime changed from nomads into agriculturists; but finding that ordinary agriculture was difficult to follow, on account of the lack of rain, were led by the force of circumstances to resort to irrigation.

We conclude that all these contrivances for storing water for irrigating the valleys, and for making the soil everywhere as productive as was possible in such an arid region, were original inventions which show the genius of the people. It is certainly, very interesting to go over the different parts of this great plateau, and see how the people provided against the drought, and how carefully they studied the changes of nature, and developed her resources. Not one, but many ways were resorted to in making the soil productive. These will be seen as we proceed, but may be mentioned briefly: 1, The simplest plan was to depend upon the rain for the crops, and to make the springs supply the people for domestic purposes. There were no cattle or sheep, or herds of any kind, which required water, but the people needed a constant supply. The result was that the houses were placed near some spring where water was constant. The pueblos were also placed near springs and lakes. The Zuni pueblo was near a spring, which became sacred, and around which were sacred vessels which were covered with figures of the water-animals and were sacred to the water divinities. This has been described by Lieut. Simpson and many other travelers. The springs which flowed out of the caves and from beneath the ledges, where the Cliff Dwellings were placed, have been described by Mr. Holmes, Mr. Jackson, Mr. Lewis W. Gunckel, and by other explorers in that region.



SACRED SPRING AT ZUNI.

2. It was probably owing to the fact that springs were so numerous among the mountain regions which bordered on the Pueblo territories on all sides, that they were chosen as the abodes of various tribes; some of whom made their homes in caves, and others built their stone houses into the sides of the cliffs, and so may be called Cliff-Dwellers. The most of these were agriculturists, though they depended upon the rain and ordinary cultivation rather than irrigation.

The best known Cliff-Dwellers are those situated to the north of the Pueblo territory in the San Juan valley, but others have been discovered among the mountains far to the southwest. These have been described by Mr. Carl Lumholtz, and already described, but we refer to them again, for they show the character of the Cliff-Dwellers generally.

Springs have been discovered in the Pueblo region, which were destroyed or killed by the people when they left the village in which they dwelt. They did this by filling them up. The springs were sometimes at a distance from the villages. Drinking water was carried by women in jars or urns placed on their heads, or carried in a net thrown over their shoulders. The village of Acoma was supplied in this way. It was perched on a high mesa, and all the water was carried up by the women.

Mr. Bandelier says:

> The presence of ancient villages on the high mesas west of the Rio Grande, near Santa Fe, in places of difficult access, without communication with the river banks, need not surprise us. Here, the rainy season is tolerably regular. Indian corn would grow without artificial watering. Springs would supply the wants of the people.*

Dr T. M. Prudden says:

> To one who has travelled much in the southwest plateau country, and knows not only just how dry it is, but, also, just how dry it is not, the residence of these early peoples in small, scattered communities along the now remote canyons and valleys, is neither surprising nor mysterious. There was warmth and shelter the year round, and for those who had learned to build, there were houses half made already by the cave walls and cliffs. It does not require very much food for bare existence, and a very small patch of corn suffices for a family. While springs and pools are rare, there are a good many places, in valleys apparently dry the summer through, in which the seepage from the back country comes down some way in the hills, and furnishes moisture enough for a crop of corn. The beds of dry streams, also, where sand is plenty, are often moist beneath the surface.†

3. Tanks have been discovered by explorers among the cliff dwellings. One of them was situated near the High House, seven hundred feet above the stream, just outside of the house. It was reached by passing out of the window or door in the side of the house, passing down by the aid of pegs to the water. Another was found in the Cañon De Chelly, at the end of the ledge on which was a village or cliff dwelling. This tank was filled with water, which was taken out of the stream below and drawn up by a rope, and poured into the tank. It was reached by passing along the narrow ledge, which led from it to the village or cluster of houses, and could not be destroyed by any prowling foe.

Mr. Bandelier speaks of tanks near Casa Grande; one with a depth of eight and one-half feet, which is surrounded by an embankment about eight or ten feet in length. He says:

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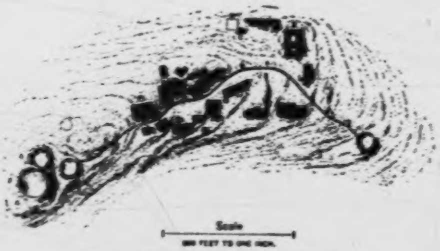
* Bandelier's Final Report, Part II., page 16.

† See Harper's Magazine, June, 1897.

Between Casa Grande and Florence the distance is nine miles. Several ancient irrigating ditches are seen on the road, some of which are quite deep. In one place I found an elliptical tank, almost as large as the one at Casa Grande and presenting a singular appearance. Lined water conduits are found at Tule, Arizona, and others at Casas Grandes in Sonora. The village of Tabira had four large artifical pools from which the people derived drinking water. The Pueblo Acoma subsists to-day upon the water collected into picturesque basins on the top of the rock, three hundred and fifty feet above the utterly dry valley. To such and similar devices the New Mexican villager had to resort, and it was a relief to him when he could nestle by the side of a permanent river, and raise beans and calabashes with the aid of primitive channels of irrigation. The tribes on the Rio Grande and people of Taos and Pecos enjoyed such privileges more than any of the other tribes. With them irrigation was easy, and frequent mention is made of it by the older writers.

4. There were reservoirs on the mesas, which were constructed by placing dams across the channels or water-spouts; leaving the low places to be filled with rain during the summer, or melted snow in the spring. There was a contrivance for supplying the wants of the village, which was very ingenious. It consisted of making a series of reservoirs, some of them above the village, some of them below, and causing the water to flow through the court, where it was used for domestic purposes, and afterward gathered into a pond and then distributed to the fields. One such existed at Pecos. Another was found at Quivira. Both have been described by Mr. Bandelier. The latter is represented in the cut.



RESERVOIRS AT QUIVIRA.

5. There were lakes in places, which furnished an abundant supply. There was a sacred lake near Walpi, which was visited by Mrs Stevenson, Prof. Tylor, and others. It was regarded as the home of the children, who were lost, but whose spirits were allowed to visit the Pueblos at their sacred feasts and carry the sacred waters to the little children, who were gathered in the estufas, and were permitted to drink from the bowls handed to them by the priests at the time of their initiation.

The lake called "Montezuma Wells" has been described. This was near a large area of agricultural land, but was surrounded by cliffs, in the sides of which are many interesting cliff dwellings. The well or pond must have furnished an abundant supply of water for the use of the people.

6. There were streams near which the pueblos were built, and which supplied the wants of the people, but were not used for irrigating purposes, as the rain was depended upon mainly. The Chaco was such a stream. Here, there were fourteen vil-

lages scattered along the banks; all of them large, and once filled with a flourishing population. It was a rich valley, and was probably once filled with garden beds and fields of maize, which furnished an abundant subsistence. The valley was deserted probably before the advent of the white man, but was, perhaps, abandoned on account of the invasion of the savages.

7. The so-called garden beds or hanging gardens, which were built in terraces on the sides of the mesas, are very interesting. They remind us of the hanging gardens of the East, and of the terraces on the Alps, where grapes are raised, and the ancient ridges in Great Britain, which have excited so much curiosity among the archæologists.*

Garden beds of a peculiar construction are found on the Sonora River in Arizona. They are described as follows by Mr. A. F. Bandelier:

> Rows of boulders, such as could be picked up in the bed of the torrent, were laid on the ground parallel to one another, intersected by transverse rows at irregular angles, thus forming rectangular areas of various lengths. They look like rude dams laid across the course of the Arroya. They were so laid in order to keep a certain expanse of ground free from the drift brought in by the streams, and to keep the floods from carrying away the crops. These contrivances belong to the kind of agricultural expedients by means of which the waters of the mountain torrents were made to serve for the irrigation of crops planted in their path.
>
> Between Santiago and the foot of the Sierra Madre are dams and dykes which extend across the Arroyas. Between the dykes are more or less regular shaped plots of tillable land, called by the inhabitants "Labores," or tilled patches. Connected with these artificial garden beds are ruins of houses, which are small buildings containing from two to four rooms.

Mr. Carl Lumholtz speaks of the garden beds which are connected with the deserted pueblos and ancient cave dwellings of the Sierra Madre. He says:

> Deserted pueblos, consisting of square stone houses, are frequently met with. They are generally found on the top of the hills and mountains, and are surrounded by fortifications in the shape of stone walls. The most interesting remains, however, are in the caves, which contain houses at times three stories high, with small windows and cross-like doors, in the ordinary conventional Indian way; even stone staircases are once in a while met with. There and everywhere through the Sierra Madre, we found *trincherus*, or stone terraces, built across small valleys, evidently intended for agricultural purposes.
>
> On every steep mountain side these extraordinary terraces of solid, large stones, constructed in the cyclopean style of masonry, arose to a height of fifteen, nay, twenty feet. We observed them even at an altitude of 7,400 feet. At one point we counted eight of them within a space of 150 feet, the aborigines having gained, by the enormous amount of labor expended, 3,500 square feet of additional surface ground; in other words, they only made room for 500 or 600 "hills" of maize.

Small, enclosed gardens called "Farming Pueblos" are common, both at Zuni and among the Tusayans. The enclosing walls are generally made of stone, sometimes of stone in combination with stakes. Upright slabs of stone have been used by the Pueblo-Builders to make walls, and by the Cliff-Dwellers to mark the graves.

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*See Bandelier's Report, Part II., page 17.

Field shelters, made out of brush and branches, with raised platforms, were common among the Pueblos. These were mere make-shifts, and do not compare with the boulder sites, which are found associated with the irrigating ditches. These are to be distinguished from the corrals, which have been erected in recent times near the pueblos; specimens of which may be seen at Walpi, Pescado, and Ojo Caliente.*

8. Aqueducts are described by Mr. Bandelier as existing at Casa Grandes, as well as an extensive system of irrigation. The following is his description:

> It is quite likely that the main portion of the field lay in the bottom near the river, where the land is very fertile and can be easily irrigated. The main irrigating ditch enters the ancient village from the northwest, and can be traced for a distance of two or three miles. It takes its origin about three miles from the ruins, at the foot of the higher slopes and near a copious stream. It looks, therefore, as if it had conducted the water from the spring to the settlement, for household purposes only. After passing a peculiar structure, it empties into a circular tank, the diameter of which is forty-five feet, its depth five feet, and continues its course to another tank, seventy-two feet in diameter, with a rim three feet high and thirty-nine feet wide; this tank is six feet deep in the centre. The acequia is best preserved on the terrace northwest of the ruins. There, its course is intercepted by gulches. It seems at a depth of about four feet below the present surface. A layer of calcareous concrete formed the bottom of a shallow trough, through which the water was conducted. This channel is about ten feet wide, and was carried with a steady and very gradual decline by means of artificial fillings, and probably by wooden channels, across intervening gulches.
>
> Another acequia, fourteen feet wide, also slightly raised above the ground, shows four longitudinal rows of stone laid at intervals of four to six feet. It looks more like a road bed than a ditch. It seemed to me, as if both the channels had been connected, and as if they were but branches of the main line running across the terraces, one designed to fill the two artificial basins near the ruins; the other entering the bottom. It seems clear that the inhabitants of the Casas Grandes had made considerable progression in irrigation, and that it at one time contained a population more dense than that of any part of the southwest. The ancient culture which flourished at Casas Grandes was similar to that which existed on the banks of the Gila and Salado, but there was a marked advance over any other portion of the southwest, shown particularly in certain household utensils, the existance of stairways in the interior of houses, and in the method of the construction of irrigating ditches. Nevertheless, the strides made were not important enough to raise the people to the level of the more southern tribes. Their plastic art, as far as displayed in the few idols and fetiches, remains behind that of the Nahua, Zapotecas, Mayas, etc. They seem to have reached an intermediate stage between them and the Pueblos, though nearer to the latter than the former.

III. The distribution of the irrigating ditches will be next considered. Irrigation was practised by nearly all the Pueblo tribes—those who were situated on the Rio Grande, on the Little Colorado, on the Gila, on the Rio Verde, and possibly on the Chaco. The irrigating ditches have been recognized in nearly all of these valleys. In giving the description of these we shall quote the various parties who have visited the Pueblos. We shall begin with those of the Rio Grande.

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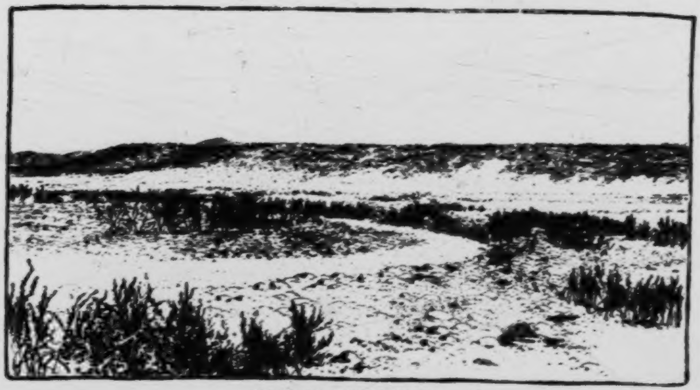
* See Eighth Annual Report, plates lxx., lxxi. and lxxiv.

Mr. Morgan refers to several localities where irrigation was practised, one of them at Taos, and the other at Mashongnavi on the Little Colorado. Of Taos he says:

> It is situated upon Taos Creek at the western base of the Sierra Madre Range, which form the eastern border of the broad valley of the Rio Grande, into which the Taos stream runs. The two structures stand about twenty-five rods apart on opposite sides of the streams, facing each other. The present occupants of the pueblo, about four hundred, are divided between the two houses, and they are thrifty, industrious, and intelligent people. Upon the east side is a long adobe wall, connecting the two buildings, or rather protecting the open space between them. A corresponding wall doubtless closed the space on the opposite side, thus forming a large court between the buildings. The creek is bordered on both sides by ample fields or gardens, which are irrigated by canals drawing water from the streams. Lieutenant Ives observed gardens cultivated by irrigation on the sides of the bluffs. Between the two, the face of the bluff had been ingeniously converted into terraces. They were faced with neat masonry, and contained gardens, each surrounded with a raised edge, so as to retain water upon the surface. Pipes from the reservoirs permitted them at any time to be irrigated.*



ANCIENT DITCH AROUND A SMALL CLEAR CREEK.

IRRIGATING DITCH ON THE RIO VERDE.

Mr. F. W. Hodge, who was connected with the Hemmingway expedition, speaks of the irrigating canals of southern Arizona as indicating a large Pueblo population and a high degree of advancement. He says:

> It is safe to say that the principal canals constructed by the ancient inhabitants of the Salado valley alone, controlled the irrigation of at least 250,000 acres of land. The outlines of 150 miles of ditches could be easily traced. Their routes are effaced from the more open ground, but there were concretions which had been deposited along the banks, as "tamers of the waters." These, with the implements which had been dropped, were sufficient to show the line which had been followed. Near one of the thirty-

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* "House and House-life," page 144.

six large communial structures—the ancient pueblo, De los Muertos—was a supply canal, the depth of which was about seven feet, and the width about thirty feet. This canal was divided into two beds, the lowest being about four feet wide, but the sides broadened until a bench was reached, which was three feet wide on either side; from these benches the banks continued broadening until they reached the brink. The bottom and sides of the canal were very hard, the supposition is that they had been plastered with adobe, and that brush fires had been made upon them till they were hardened.

It is noticed that nearly all the pueblos were situated, not near the river, but near the ends of the canals, showing that the builders were dependent upon the canals for subistence. The means of transportation were furnished by the canals, so that countless boulders from the river bank had been carried ten or twelve miles to the vicinity of the pueblos. At a group of ruins, near Mesa City, the remains of an extensive irrigation system, the canal bed had been carried through a large knoll with inconceivable difficulty, in order to reach the tract of fertile land.

The ancient canal was utilized by the Mormons for fully three miles, with a saving of from $20,000 to $25,000. The pueblos of the Gila were generally larger than those of the Salado, irrigating canals were more extensive, with many hillside reservoirs, showing that an extensive population existed here. The sites of the ancient reservoirs were discovered, These were natural sinks, deepened by artificial means, and served the purpose of storage basins for surplus waters. One such was found to be a mile long, and a half mile wide. The most of the valley lands were once covered with a network of irrigating ditches.

In the region of the Zunis, the canals have not been traced, though the supposition is that they cultivated the soil in the same way as the western tribes did. The description of the Zuni houses, furnished by historians, would indicate that they were on the summit of the mesas.*

Mr. Bandelier has also described the irrigating ditches in the valley of the Verde and elsewhere. This region has been described by Mr Cosmos Mindeleff. He says:

The region which furnishes the best examples of irrigating ditches and the greatest number of contrivances for cultivating the soil by this means, is that which is situated far to the west in the region of Limestone Creek and the Rio Verde, which lies between the home of the Cliff-Dwellers at the north, and the ancient and ruined villages on the Gila, and to the west of the inhabited villages of the Moquis and Zunis. This seems to have been a migrating route of the Cliff-Dwellers, and possibly may have been the resort of tribes who were allied to the Pueblos. There are many stone villages, cavate lodges, boulder sites and other signs of habitation scattered throughout the entire region.

The Rio Verde is throughout its length a mountain stream. Rising in the mountains and plateaus bounding two great connected valleys northwest of Prescott, known as Big Chino valley and Williamson valley, both over 4,000 feet above the sea, it discharges into Salt river about ten miles south of McDowell and about twenty-five miles east of Phœnix, at an elevation of less than 1,800 feet above the sea. The fall from Verde to McDowell, a distance of about sixty-five miles, is about 1,500 feet. The whole course of the river is but little over 150 miles.

Its rapid fall would make the river valuable for irrigation if there were tillable land to irrigate; but on the west the river is hugged closly by a mountain chain whose crest, rising over 6,000 feet above the sea, is sometimes less than two miles from the river, and whose steep and rugged sides descend in an almost unbroken slope to the river bottom. The eastern side of the river is also closely confined, though not so closely as the western, by a chain of mountains known as the Mazatzal range.

Most of the modern settlements of the Rio Verde are along the upper

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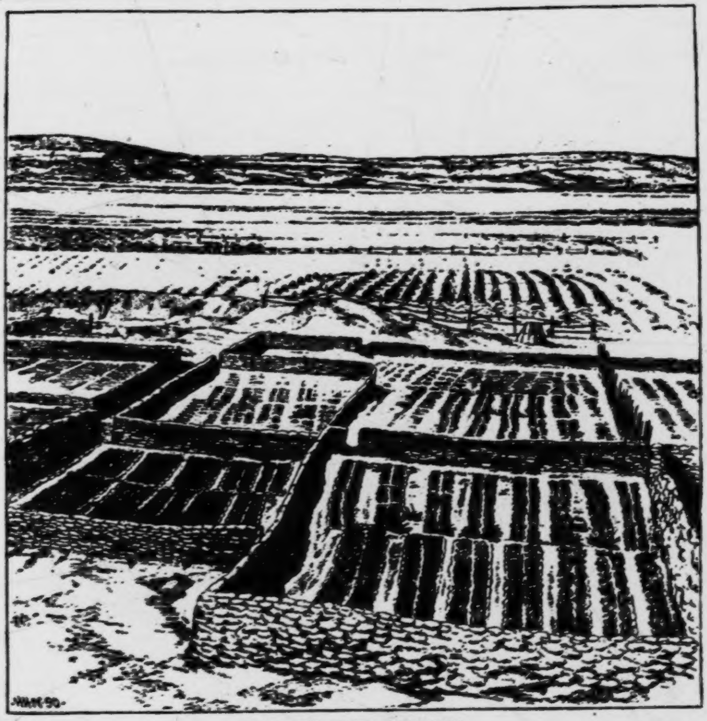
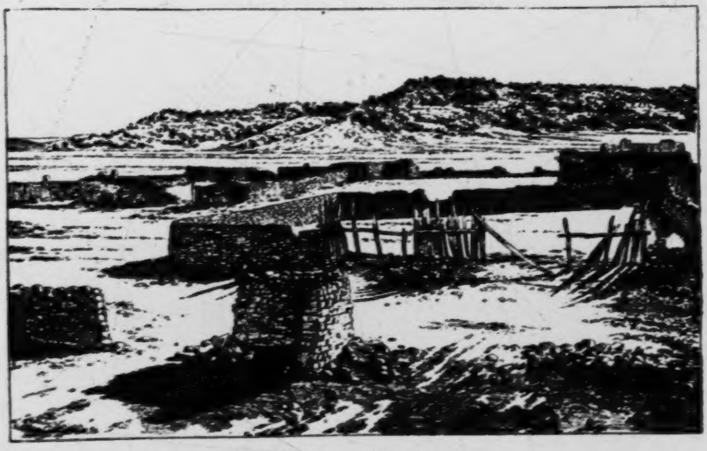
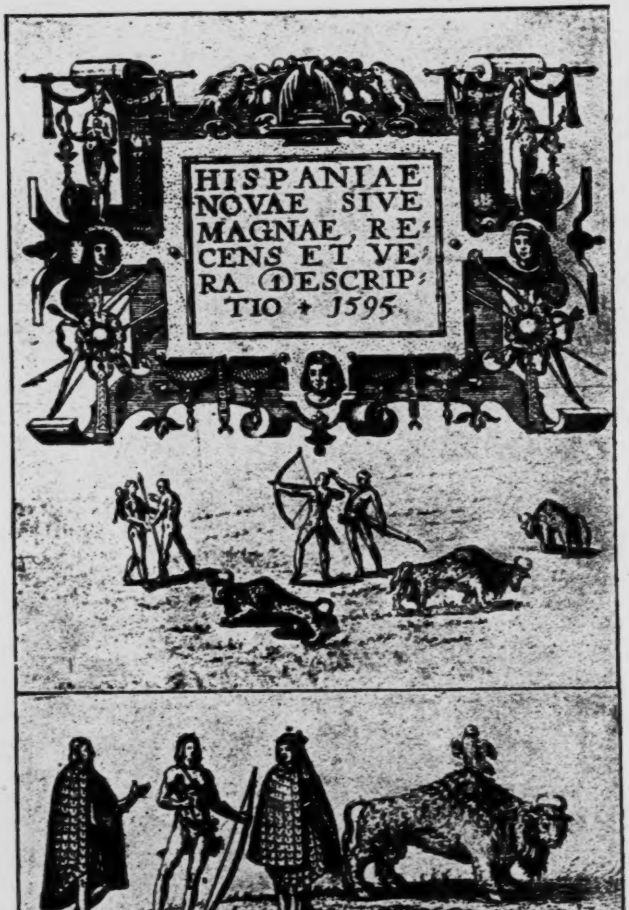
*See "Prehistoric Irrigation," by F. W. Hodge.



GARDEN BEDS AT ZUNI.



CORRALS AT PESCADO.


HISPANIAE NOVAE SIVE MAGNAE, RECENS ET VERA DESCRIPTIO 1595

BUFFALO AND HUNTERS, PORTRAYED BY DE BRY.

portion of its course. Prescott is situated on Granite creek, one of the sources of the river, and along other tributaries, as far down as the southern end af the great valley in whose centre Verde is located, there are many scattered settlements; but from that point to McDowell there are hardly a dozen houses all told. This region is most rugged and forbidding. There are no roads, and few trails, and the latter are feebly marked and little used.

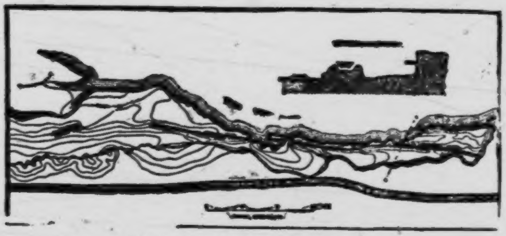
The former inhabitants of this region were an agricultural people, and their villages were always located either on or immediately adjacent to some area of tillable soil. This is true even of the cavate lodges, which are often supposed to have been located solely with reference to facility of defense. Perched on the hills overlooking these bottoms, and sometimes located on the lower levels, there was once a number of large and important villages, while in the regions on the south, where the tillable areas are as a rule very much smaller, the settlements were, with one exception, small and generally insignificant.

The irrigating ditches in the valley of the Verde are, perhaps, the most interesting of any, as they form a most important feature of the region, and are very conspicuous; in fact, the most conspicuous objects in the landscape. The age of these ditches is unknown, but they are old enough to have been affected by the changes of nature, and so may be ascribed to a geological age, though a very recent epoch in that age. They are connected with boulder sites and ancient ruins, which seem very ancient, but which were erected by the earlier Pueblo tribes, as temporary residences while working the fields.

The following is the description of one of these ditches given by Mr. Mindeleff:

> One of the finest examples of an aboriginal irrigating ditch that has come under the writer's notice, occurs about two miles below the mouth of Limestone creek, on the opposite or eastern side of the river. At this point there is a large area of fertile bottom land, now occupied by some half dozen ranches, known locally as the Lower Verde settlement. The ditch extends across the northern and western part of this area. The plate shows a portion of this ditch at a point about one-eighth of a mile east of the river. Here the ditch is marked by a very shallow trough in the grass-covered bottom, bounded on either side by a low ridge of earth and pebbles. North of this point the ditch can not be traced, but here it is about forty feet above the river, and about ten feet above a modern (American) ditch. It is probable that the water was taken out of the river about two miles above this place, but the ditch was run on the sloping side of the mesa which has been recently washed out.
>
> There is no reason to suppose that the ancient ditch did not irrigate nearly the whole area of bottom land. The ancient ditch is well marked by two clearly defined lines of pebbles and small boulders, as shown in the illustration. Probably these pebbles entered into its construction, as the modern ditch, washed out at its head and abandoned more than a year ago, shows no trace of a similar marking.
>
> A little west and south of the point shown in the cut the bottom land drops off by a low bench of three or four feet to a lower level or terrace, and this edge is marked for a distance of about a quarter of a mile by the remains of a stone wall or other analogous structure. This is located on the extreme edge of the upper bench, and it is marked on its higher side by a very small elevation. On the outer or lower side it is more clearly visible, as the stones of which the wall was composed are scattered over the slope marking the edge of the upper bench. At irregular intervals along the wall there are distinct rectangular areas about the size of an ordinary pueblo room, i. e., about eight by ten and ten by twelve feet.
>
> In February, 1891, there was an exceptional flood in the Verde river, due to prolonged hard rain. The river in some places rose nearly twenty

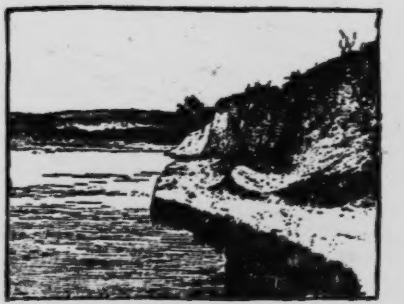
feet, and at many points washed away its banks and changed the channel. The river rose on two occasions; during its first rise it cut away a considerable section of the bank, near a point known as Spanish Wash, about three and one-half miles below Verde, exposing an ancient ditch. During its second rise it cut away still more of the bank and a part of the ancient ditch exposed a few days before. The river here makes a sharp bend and flows a little north of east. The modern American ditch, which supplied all the bottom lands of the Verde west of the river, was ruined in this vicinity by the flood that uncovered the old ditch. The cut is a map of the ancient ditch drawn in the field, with contours a foot apart, and showing also a section, on a somewhat larger scale, drawn between the points A and B on the map. Plate A is a view of the ditch looking westward across the point where it has been washed away, and plate B shows the eastern portion, where the ditch disappears under the bluff.



MAP OF ANCIENT DITCH.

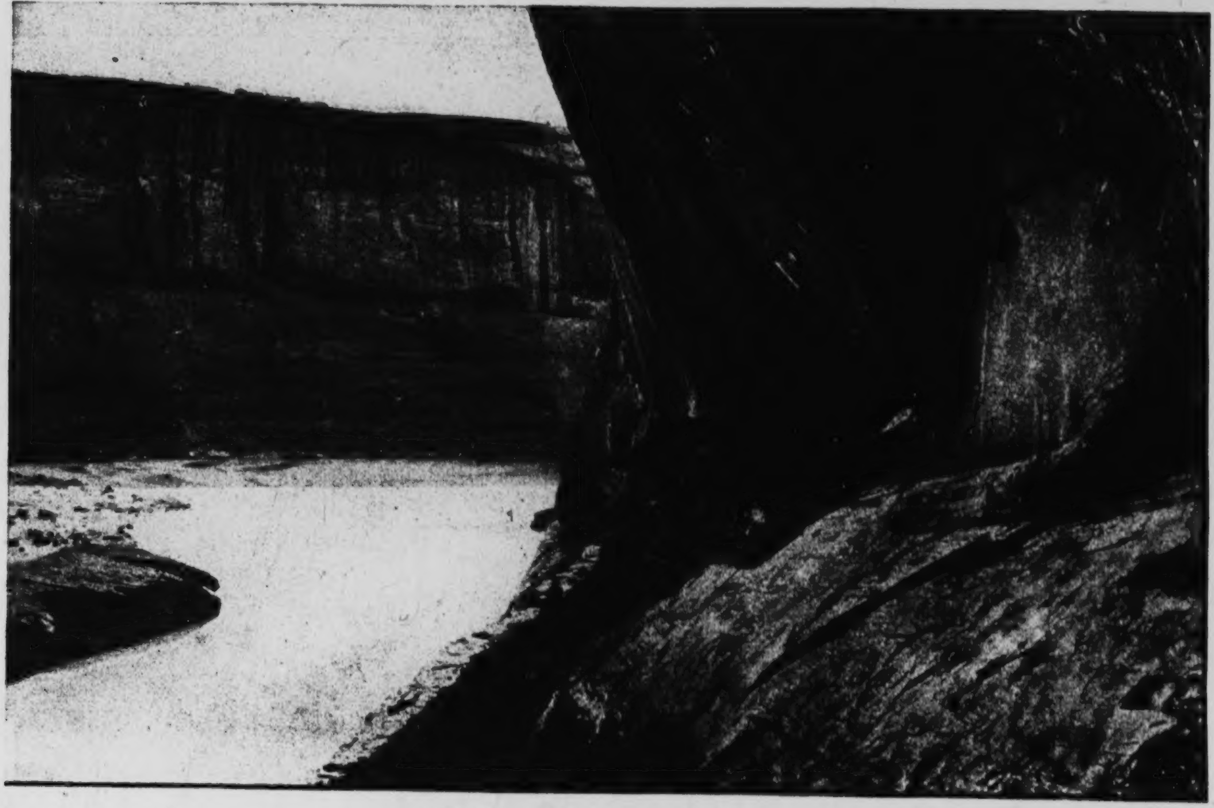
The bank of the river at this point consists of a low sandy beach, from ten to fifty feet wide, limited on the south by a vertical bluff ten to twelve feet high, and composed of sandy alluvial soil. This bluff is the edge of the bottom land before referred to, and on top is almost flat and covered with a growth of mesquite, some of the trees reaching a diameter of more than three inches. The American ditch, which is shown on the map, runs along the top of the bluff skirting its edge, and is about fourteen feet above the river at its ordinary stage. The edge of the bluff is shown on the map by a heavy black line. It will be observed that the ancient ditch occurs on the lower flat, about three feet above the river at its ordinary stage, and its remains extend over nearly 500 feet. The line, however, is not a straight one, but has several decided bends. The cut shows this ancient ditch just where it turned southward and passed under the bluff.

About fifty feet north of the main ditch, at the point where it passes under the bluff, there are remains of another ditch, as shown on the map. This second ditch was about a foot higher than the main structure, or about four feet above the river; it runs nearly parallel with it for about thirty feet and then passes into the bluff with a slight turn toward the north. It is about the same size as the main ditch.



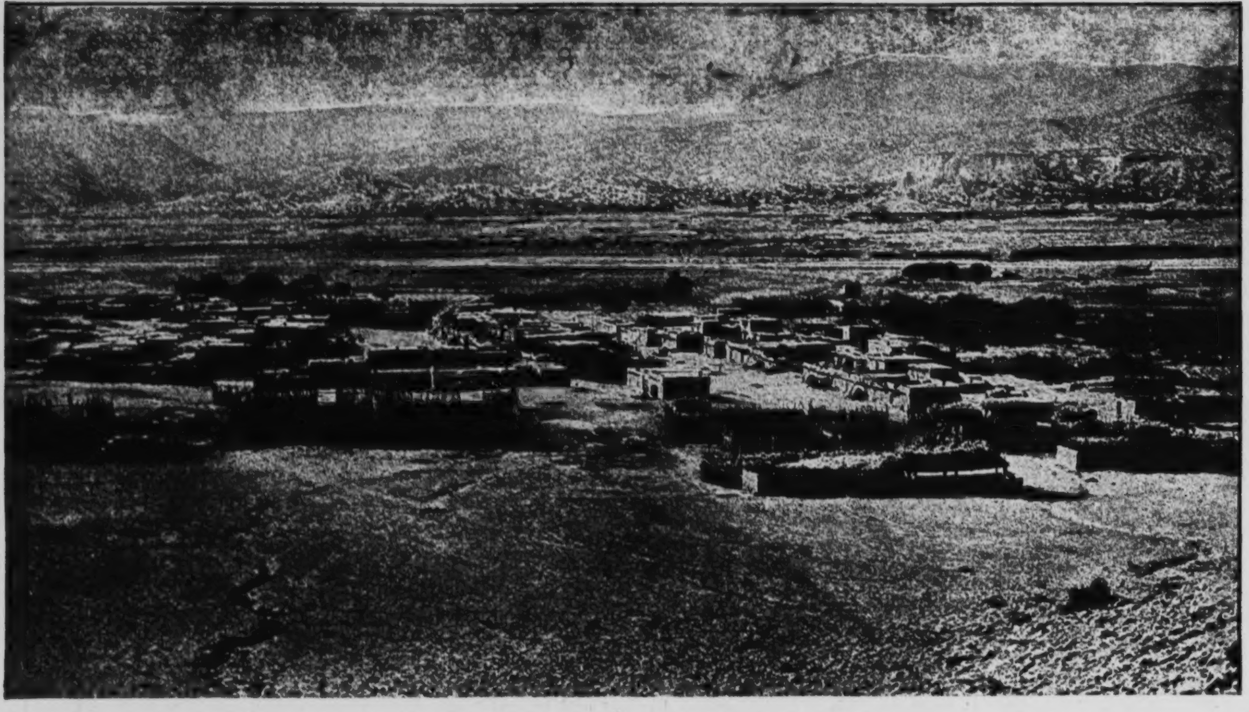
SECTION OF THE DITCH.

As already stated, the American ditch is about fourteen feet above the river, while the ancient ditch is less than four feet above the water. This decided difference in level indicates a marked difference in the character of the river. The destruction of the modern ditch by the flood of 1891 is not the first mishap of that kind which has befallen the settlers. The ditch immediately preceding the current one passed nearly over the centre of the ancient ditch, then covered by ten feet or more of alluvial soil, and if a



RESERVOIR IN CANYON DE CHELLY.

The reservoir is five by fifteen feet, plastered inside. Access to the interior was gained by means of



THE MODERN PUEBLO AT JEMEZ, SHOWING CORRALS, GARDEN BEDS, STREETS, AND THE STREAMS.

ditch were placed to-day on the level of the ancient structure it would certainly be destroyed every spring. The water that flowed through the modern ditch was taken from the river at point about three miles farther northward, or just below Verde. The water for the ancient ditch must have taken out less than a mile above the southern end of the section shown in the map.

At first sight it would appear that the ancient ditch antedated the deposit of alluvial soil forming the bottom land at this point, and this hypothesis is supported by several facts of importance. It is said that ten years ago the bottom land, whose edge now forms the bluff referred to, extended same twenty-five or thirty feet farther out, and that the river then flowed in a channel some 200 or 300 feet north of the present one. Be this as it may, the bottom land now presents a fairly continuous surface, from the banks of the river to the foothills that limit the valley on the west and south, and it is certain that this bottom land extended over the place occupied by the ancient ditch; nor is it to be supposed that the ancient ditches ended abruptly at the point where they now enter the bluff. The curves in the line of the ancient ditch might indicate that it was constructed along the slope of a hill, or on an uneven surface, as a deep excavation in fairly even ground would naturally be made in a straight line.

In conclusion, it should be noted, in support of the hypothesis that the ditch was built before the material composing the bluff was laid down, that immediately under the ditch there is a stratum of hard adobe-like earth, quite different from the sand above it and from the material of which the bluff is composed.

The hypothesis which accords best with the evidence now in hand, is that which assumes that the ditch was taken out of the river but a short distance above the point illustrated, and that it was built on the slope of a low hill, or on a nearly flat undulating bottom land, before the material composing the present bottom or river terrace was deposited, and that the ditch, while it may be of considerable antiquity, is not necessarily more than a hundred or a hundred and fifty years old; in other words, we may reach a fairly definite determination of its minimum, but not of its maximum antiquity.

This description of the irrigation on the Rio Verde has been given in all its details and in the words of the explorer, that the reader may learn the character of the works and from it judge what their routes were. The enquiry which proves the most interesting is the one which relates to the age of the ditch. We have seen that Mr. Mindeleff considers the ditch to be comparatively modern—not over one hundred and fifty years old; but the recent discovery of an irrigating ditch in a region somewhat remote from this seems to controvert the opinion, or at least shows that there are ditches which are older, in fact so old as to be carried back to a geological period when the lava beds were in a state of formation.

The account of it is given in the New York Tribune and qnoted in the American Architect and Building News. It is as follows:

Discoveries were made recently in the lava beds of New Mexico, some of which are situated eighteen miles west of Santa Fe, which prove that thousands of years ago there existed in New Mexico a system of reservoirs and irrigation viaducts that is unparalleled at this age. Under the lava, which covers hundreds of square miles, are found traces of cemented ditches and reservoirs that are marvels of civil engineering. Irrigation engineers have much to learn from the people, older than the Pueblo race, who inhabited New Mexico when the race from which Columbus sprang were still bar-

barians. The ancients provided against seepage by cementing the bottoms of their ditches wherever they are conducted across loose soils. Their ditches wound in and out at the base of mountain ranges, following the sinuosities of canyons and rounding points in such a manner as to catch all the storm water before it was absorbed by the loose sands at the mountains' base. Reservoirs at convenient basins stored the water, which was led in cemented ditches across the loose soils to where it was needed for use. Chasms were crossed by viaducts, and wonderful engineering devices were used for the removal of silt that might be used as an aid to the fertility of loose and rocky soils otherwise valueless. Into some of the ditches lava has run, showing their great antiquity. Others are now covered with shifting sands, but enough are still visible in many places in New Mexico to enable the skilled engineer to understand the system which the prehistoric New Mexicans rendered so effective.

This discovery seems to indicate that the period in which the stone pueblos and the irrigating ditches were constructed was of much greater antiquity than has been supposed, for they show the character of the people who built the canals and used the water for irrigating their fields. It also gives us many hints as to the different places in which irrigation was practiced, as well as the different stages of progress through which the inhabitants passed. The very existence of these canals, or ditches, proves that the inhabitants had changed from the hunter life to the agricultural, and that with this change there had come an entirely different condition of society. The people were no longer nomads, wandering from place to place, without any settled home, but were sedentary and lived in permanent villages. No longer savages governed by every new impulse, but were organized into village communities, and were brought under a government suited to the village life.

The date at which this change occurred can not now be determined, but if the report which has been quoted above is true and the facts are as they are stated, it must have been far back in prehistoric times, before any of the known wild tribes had invaded the region, and when the geological conditions were very different from what they are at present. Still, it is wise to hold our minds in suspense until the facts are fully known and data shall be secured which shall prove that the conclusion is correct.

PLATE A. OLD IRRIGATING DITCH NEAR VERDE—LOOKING WESTWARD.

PLATE B. OLD IRRIGATING DITCH NEAR VERDE—LOOKING EASTWARD.

# CHAPTER XVIII.

## THE BEGINNINGS OF PUEBLO ARCHITECTURE.

Various opinions have been advanced as to the origin of pueblo architecture. The most plausible of these is that it grew up in the very region where it appears, and was the result of the environment. The shape of the cliffs suggested the idea of building the houses in terraces, and the rough stones, of which there was an abundance in this region, furnished the material for the walls. It is an opinion advanced by many that the pueblos were not built all at once, but that they commenced as a smaller edifice, and that as the inhabitants grew more numerous it was enlarged by the addition of single apartments. The theory is that every single apartment is a unit. The pueblo is formed from a combination of these square apartments, very much as a honey comb is formed by the combination of many separate cells. There must be, however, a cause which will account for the combination. But what was the cause? In the case of the honey comb there is an organism which is full of life, and which works according to instinct without any variation. The instinct of the bee requires it to gather honey, not only for itself, but for the entire hive, and store it in the cells. The question is whether there was such a cause among the people who built the pueblos. In answer to this, we might say that the mode of subsistence which was best adapted to this region was that form of agriculture which was conducted by the whole community, and which supplied the wants of all in the pueblo. There was, however, an organism which resembled that which appears among the bees, even a government, which might be compared to theirs, embodied in what is called the village community, which is an almost universal form of life among the uncivilized races of the earth, and often results in the appearance of communistic houses.

On this point we shall do well to quote the opinion of Sir Henry Maine. He says: "It has been assumed that the tribal condition of society belonged at first to clan communities, and that when associations of men first settled down upon land a great change occurred. Such is the case in all countries. The naturally organized, self-existing community has been regarded as an institution especially characteristic of the Aryan race, but M. Levalye has described them as found in Java. M. Renan discovered them among obscure Semitic tribes in North Africa. Mr. Freeman says: "The Germanic villages are formed of men bound together by a tie of kindred, in its first stage, natural; in its later stage, artificial (totemistic)"

Sir Henry Maine says further: "The first steps in the transition seem to be marked by the joint family of the Hindoos, by the house community of the Sclavonians, and by the true village community as found in Russia. The Hindoo families are joint in food, in worship and estate, and are constantly engaged in the cultivation of the land. What holds them together is not the land, but consanguinity. In Russia the relationship is no longer to be found, but the Russian peasants really believe in the common ancestry. Accordingly, the arable lands are periodically redistributed."

"In comparing the two extant types of the village community, the common dwelling and the common table which belonged to the joint family and to the house community, are no longer to be found. The village is an assemblage of houses contained within narrow limits but composed of separate dwellings, each zealously guarded from the intrusion of a neighbor."

Here, then, we trace the origin of the pueblo life to the change from the nomadic state to the sedentary condition, in other words, from hunting to agriculture, though the consanguinity which prevailed in the earlier condition is retained in the later, either by artificial ties, such as totemism, or imaginary descent from a common ancestry. This is the theory advanced by those who have been studying the village community in such faraway lands as India, Russia, Sclavonia, Germany, and northern Africa.

We find the germ of pueblo life and architecture to be contained in the village community; or, in other words, the clan village, which exists in its earliest stages among the nomads, but which is carried to a higher stage among the sedentary tribes, and which ultimately results in the ancient city. The village community was not transplanted, but grew up spontaneously from the organism which inhered with primitive society and appeared on the different continents. Many specimens of the village community are found in America, and the architecture is everywhere correlated to it.

Even the wild tribes which still inhabit the pueblo region, all live in villages and build their houses in clusters and are ruled by some village chief. There are houses in Arizona, which were built of wattle-work in rectangular form and arranged in rows about a central area, which constitute a village. There are others in Oregon, which were built in long rows, all under one roof, with passageways between the houses.

Lewis and Clarke describe such as are situated on the headwaters of the Missouri, and Dr. Walter Fewkes describes the ruins of others in Arizona. These were the abodes of the nomadic tribes, but mark the transition from the nomadic to the sedentary state.

There were many things involved in the change from the wandering life to the permanent village community. In the first place, the round hut of the hunter gave place to the square rectangular house of the agriculturist, the stone being used for wood and becoming an index of the new social status. The straggling village, composed of houses stretched along the side of the stream, or of the ditch, with a citadel in the centre, may have marked the intervening period. The straggling village gave place to the compact, terraced and many-storied pueblo. The ordinary spring, which flowed out from beneath the rocks and supplied the rude camp with drinking water, was supplanted by the spring which was walled up and was furnished with drinking vessels which were sacred to the water divinities and were covered with the symbols of a new religion. The religion of the people was also changed. While they retained their clan totems in the shape of animal images as fetiches. these no longer represented the divinities of the clans, but were supposed to be the divinities of the sky and ruled the different parts of the sky and the earth and the above and below. The priesthood of the bow was substituted for the medicine-man, and the offerings were made to the sun and moon and such Nature powers as wind and lightning, and especially the rain.

The domestic life of the people was also changed, for the women were no longer the chief providers for the household, nor were they the slaves of the men, but they had control of the household and dwelt with the children in apartments by themselves; the men having their assembling place with the secret societies in the kivas, which are most of them underground.

The provisions for defence were greatly changed. The rude stone circle on some isolated spot, which was used as an outlook, gave place to the lofty stone tower situated on the promontory, or the summit of the mesa. The mountain path gave place to the trail with supporting walls; the rude ladder, to the stone stairway, and the shrine, which was hidden away in a cave or the rocks, was supplanted by the kiva, which was full of the symbols of the creation and was used for the initiatory rites of the people. There are many other things which mark the change from the hunter state to the agricultural, and it is interesting to take these and follow up the study, but there is another subject which we need to pursue before we understand the change in all its bearings. The question is whether there are any connecting links which exhibit the transition from the wild life of the hunters to the sedentary life of the agriculturists, or any structures which show the different stages through which the people passed. In answer to this question, we will say that there are such links, though the difficulty is to find them and identify them, for in the majority of places they have been obscured by the later inventions and by the accumulations of time. There is, however, one locality in which the structures are very rude and show all stages of progress and where the relics seem to correspond, and which furnishes us an excellent field for this study. It is found in the western part of the Pueblo territory, which has long been deserted by the Pueblos and is not even claimed by the wild tribes. This district was one of the last to be explored, and is very important because of its bearing upon the history and antiquity of the Pueblos and the Cliff-Dwellers, as it is situated on the borders of the Pueblo territory and between the old habitat of the Cliff-Dwellers on the San Juan and that of the Pueblos who dwelt on the Gila and the Salado rivers, and possibly lay in the line of the migrations which occurred among the different tribes. It is a region full of ruins, all of which have been deserted and are now silent and desolate.

This region, comprising the valley of the Rio Verde in Arizona, and from Verde to the confluence with the Salt river, contains a great number of ruins, many of which seem to have been agricultural settlements, and so are especially worthy of notice. These were first mentioned by Mr. Leroux, who accompanied Lieut. Whipple's party as guide, in 1856; afterward described by Dr. W. J. Hoffman, who was connected with the Hayden Survey in 1876* ; by Dr. E. A. Mearns, U. S. A., who was stationed for some years at Camp Verde, and by Cosmos Mindeleff, who was connected with the Ethnological Bureau,†

The ruins of this region may be divided into several classes, which mentioned in the reverse order of their succession would be about as follows: First, stone villages on bottom lands; second, stone villages on defensive sites; third, cavate lodges; fourth, boulder-marked sites; fifth, cliff villages.

The first class resemble the Pueblos farther east, for they have courts in the interior surrounded by compact apartments. There is an occasional single room in the interior of the court which resembles a kiva also. Those of the second class are generally furnished with defensive walls, and are placed on sites where the ground falls away so suddenly that it is almost impossible to climb up without artificial aid. The cavate lodges are dug into the sides of a cliff at varying heights, sometimes making two rows, one above the other. They generally overlook areas of tillable land. They give every evidence of having been occupied, for they have door-ways, fire-places, and separate rooms. The boulder sites are the rudest of all, so rude, in fact, that it is sometimes difficult to understand their object. The masonry does not compare with the fine work done by the cliff villages, and was so roughly and carelessly executed as to give little evidence of such details as door and window openings. The rough and unfinished surface, and the use of an inferior material close at hand, rather than a better material a short distance away, indicates ignorance on the part of the builders of many constructive devices. The cavate lodges may be ranked at the lower end of the scale; the stone villages with courts, the top of the scale, and the boulder sites and cliff villages in the middle, or as intervening links.

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*See Hayden's Survey, Tenth Annual Report (1878), page 478; also, Popular Science Monthly for 1890.

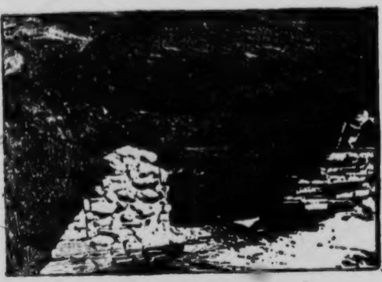
†See Thirteenth Annal Report (1891-92); Washington, 1896; page 185.

The ruins of this region are important for several reasons. First, they show the great difference between the houses of the agricultural and the wild tribes; second, they throw light on the growth of architecture among the Pueblos, and the progress which was made after they began the practice of irrigation; third, they furnish many hints as to the migrations of the people who built the pueblos into their territory, though little information can be gained from them in reference to any migration of the Cliff-Dwellers out of it; fourth, they furnish the earliest and most primitive form of cliff dwellings, as well as the transition stages between the rude huts of the nomadic tribes and the advanced structures of the Pueblos and Cliff-Dwellers. The region has been explored by Dr. J. Walter Fewkes and Mr. Mindeleff, both of whom regard it as marking the migration routes of the pueblo people, though they differ with reference to the direction which was taken; as the first traces them from the south to the north, the latter from the north to the south. Mr. Mindeleff says:

> The remains in the valley of the Rio Verde derive an additional interest from their position in the ancient Pueblo region. On the one hand, they are near the southwestern limit of that region, and on the other hand, they occupy an intermediate position between the ruins of the Gila and Salt river valleys and those of the northern districts. Here, remains of large villages with elaborate and complex ground plan, indicating a long period of occupancy, are found, and within a short distance there are ruins of small villages with very simple ground plan, both produced upon the same environment; and comparative study of the two may indicate some of the principles which govern the growth of villages and whose result can be seen in the ground plans. Here, also, there is an exceptional development of cavate lodges, and corresponding to this development an almost entire absence of cliff dwellings This region is not equal to the Gila valley in data for the study of horticultural methods practiced among the ancient Pueblos, but there is enough to show that the inhabitants relied principally and, perhaps, exclusively on horticulture for means of subsistence, and that their knowledge of horticultural methods was almost, if not quite, equal to that of their southern neighbors.
>
> It is not known what particular branch of the pueblo-building tribes formerly made their home in the lower Verde valley, but the character of the masonry, the rough methods employed, and the character of the remains suggest the Tusayan. It has been already stated that the archæologic affinities of this region are northern, and do not conform to any type now found in the south; and it is known that some of the Tusayan gentes—the water people—came from the south. A complete picture of aboriginal life during the occupancy of the lower Verde valley would be a picture of pueblo life pursued in the face of great difficulties, and with an environment so unfavorable that had the occupation extended over an indefinite period of time it would still have been impossible to develop the great structures which resulted from the settlements in Chaco canyon.
>
> In this connection it should be noted that all the ruins herein described are of buildings of the northern type of aboriginal pueblo architecture and seem to be connected with the north rather than the south.
>
> In the region under discussion cavate lodges usually occur, in connection with and subordinate to village ruins, and range in number from two to three rooms to clusters of considerable size. Here, however, the cavate lodge is the feature which has been most developed, and it is noteworthy that the village ruins that occur in connection with them are small and unimportant and occupy a subordinate position.
>
> In the cavate lodges, window openings are not found; there is but one

opening. As a rule the doorways are wider at the top than at the bottom. This feature is shown in the cut in which the framing is extended up on one side only half the height of the opening, which is hollowed out to increase its width. The large opening on the right was caused by recent breaking out of the wall. This is the counterpart of the notched doorway, which is the standard type of the cliff ruins and had its origin in the time when the pueblo builders had no means other than blankets of temporarily closing door openings, and when all the supplies of the village were brought in on the backs of the inhabitants.

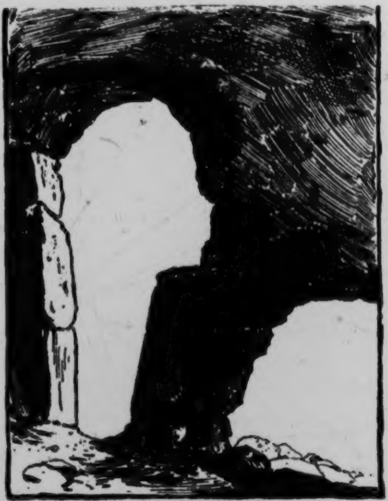
Storage cists are sometimes hewn out of the rocks in the exterior walls of the cliff, and partly enclosed by a rough, circular wall. An example of this kind is shown in the cut.



STORAGE CIST.

The most interesting structures in this region are the stone villages; quite a number of which have been described. One of them is represented in the plate. It is on the eastern side of the Verde, just below the mouth of Beaver Creek, opposite and a little above Verde.

It is one of the best examples of a large village located on a defensive site. Here, there is a group of eight clusters, extending half a mile up and down the river, and some of the clusters have walls still standing to the height of eight or ten feet. The ruins are located on a knoll which forms a sort of promontory, or tongue of land rising from a flat bench, the whole, some 280 feet above the river bottom. These clusters are shown in their proper position in the plate, which is a general view, from the east, and shows the main ruin on the Butte. The modern settlement seen in the middle distance is Verde. There is no evidence that any portion of this cluster attained a greater height than two stories, and only a small number of rooms reached that height. The tendency to cluster rooms in one large, compact group was undoubtedly due primarily to hostile pressure from outside. Another village is situated on a promontory on the southern side of the East Verde. The village overlooked a large area of low bottom land, and is itself overlooked by the foot-hills rising behind it; the high mesas forming part of the Mazatzal Mountains. The walls of this village were built



CAVE FRONT.

RUINED VILLAGE ON THE RIO VERDE

BOULDER SITES ON THE RIO VERDE.

of flat boulders and slabs of limestone. There were about forty rooms. The village was of considerable size and was built up solidly, with no trace of an interior court.

Ruins of villages built of stone represent the highest degree of art in architecture obtained by the aborigines of the Verde Valley, and the best example of this class of ruins is found on the east side of the river, about a mile above the mouth of Limestone Creek. This is the largest ruin on the Verde.

It covers an area of about 160 square feet, or over five acres. It has some 225 rooms on the ground plan; most of the rooms were but one story in height, but the plan was similar in general character to Zuni. It was divided into a number of courts, around which were four well-defined clusters; the largest court was in the centre of the village, and within it a small, single room, which may have been a kiva or sacred chamber. The arrangement of the courts is suggestive of the continued growth of the pueblo by accretions from the outside; the smaller courts were in the middle of the ruins, and the larger courts were ontside of these. Some of the rooms are quite large, but are oblong, showing that no roofing timbers longer than fifteen or twenty feet could be obtained, except only at points many miles distant. They were, therefore, limited to that length. The division into clusters indicates an aggregation of related gentes banded together for protection; also, a hostile pressure from the outside, and an occupancy extending over a considerable period of time. Absence of clearly-defined passage-ways to the interior of the village is noticeable.

We turn from these compact villages which were occupied by related gentes and are good specimens of pueblo architecture, to examine the boulder sites which are common in the same region, but which mark the opposite extreme in the history of pueblo architecture. They are very rude structures in themselves, and are scarcely worthy of notice, but as they mark a transition from the rude hut of the nomads to the stone structures of the agriculturist, and the transition from the original village community to landed estate, they prove very interesting.

All the villages in the valleys were originally occupied by agricultural communities, but were surrounded by a certain amount of land which was held in common by the village as its territory, and was cultivated by the people and its products shared in common. Where the villages were on mesas it was the custom, among the Pueblos, for the people to leave the village itself and move to some valley where the soil was rich, and there build farming shelters and spend the summer in cultivating the soil. The land, here, did not belong to individuals but to the community, and was free to all. Their only claim was that they occupied it from season to season and lived off from its products. The boulder sites indicate the spots where these farming shelters were erected, or possibly the places where garden-plats or corn-fields were situated. The interest which they possess consists in the fact that they present the rudest form of architecture, and, at the same time, the earliest stage of land ownership. If they mark the sites of temporary shelters, rather than of permanent villages, they were occupied by fragmentary bands, rather than by any organized clans, and were surrounded by lands which were cultivated in common by several villages, each band having a right only to the land which it cultivated.

The fact, however, that these boulder sites were in a region where there were cliff-dwellings, cavate houses, irrigating ditches, ruins of permanent compact villages, pueblos, or solitary houses, with an occasional shrine upon the pinnacles adjoining, makes them the more interesting; for they show the existence of village life, which was greatly diversified, and which was continued through many different periods, as well as an architecture which passed through many different stages.

The cliff-dwellings of this region are important, for they are the connecting links between the rude structures of the wild tribes and the elaborate pueblos which were occupied by the agriculturalists. They differ from the cliff-dwellings of every other region, in that they are mere chambers built up against the wall of the cliff, and are very rude in construction; while the cliff-dwellings elsewhere are built upon solid ledges, and are parts of villages which are furnished with houses, estufas, towers, courts, and all the features of the pueblo. Dr. J. Walter Fewkes has discovered a number of such villages in the Red Rock, not far from the Verde Valley, to which he has given certain names. They are: Palatki, Horanki, Red House, and Bear House. He thinks that they mark one of the natural pathways or feasible routes of the migration between the southern prehistoric people and the northern, and thinks that they indicate a transition stage of culture.

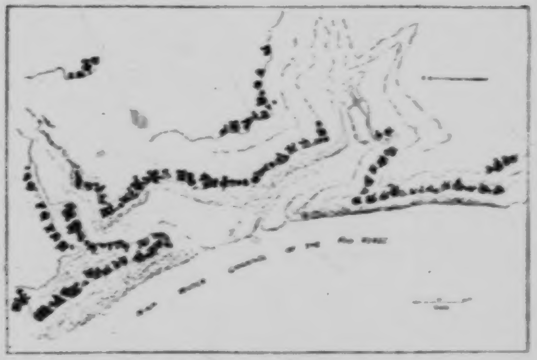
Mr. Fewkes, however, thinks that some of the boulder sites were ancient garden beds, corresponding to those on the Gila, which have been described by Mr. Bandelier. If so, they are in contrast with the garden beds of the Zunis, and show an early stage of agriculture. Mr. Mindeleff regards them as the foundations of houses or farming shelters, which were constructed out of wood. He says:

> Within the limits of the region here treated there are many hundreds of sites of structures and groups of rooms now marked only by lines of water rounded boulders. As a rule each site was occupied by only one or two rooms, although sometimes the settlement rose to the dignity of a village of considerable size. The rooms were nearly always oblong, similar in size and ground plan to the rooms composing the village ruins already described, but differing in two essential points, viz.: character of site and character of the masonry. As a rule these remains are found on and generally near the edge of a low mesa or hill overlooking some area of tillable land, but they are by no means confined to such locations, being often found directly on the bottom land, still more frequently on the banks of dry washes at the points where they emerge from the hills, and sometimes on little islands or raised areas within the wash, where every spring they must have been threatened with overflow or perhaps even overflowed. An examination of many sites leads to the conclusion that permanency was not an element of much weight in their selection.
>
> Externally these boulder-marked sites have every appearance of great antiquity but all the evidence obtainable in regard to them indicates that they were connected with and inhabited at the same time as the other ruins

in the region in which they are found. They are so much obliterated now, however, that a careful examination fails to determine in some cases whether the site in question was or was not occupied by a room or group of rooms, and there is a notable dearth of pottery fragments such as are so abundant in the ruins already described.

The boulders which now mark these sites were probably obtained in the immediate vicinity of the points where they were used. The mesa on which the ruin occurs is a river terrace, constructed partly of these boulders; they outcrop occasionally on its surface and show clearly in its sloping sides, and the washes that carry off the water falling on its surface are full of them.

In the northern end of the settlement there are faint traces of what may have been an irrigating ditch, but the topography is such that water could not be brought on top of the mesa from the river itself. At the southern end of the settlement, northeast of the point shown in the illustration, there are traces of a structure that may have been a storage reservoir. The surface of the mesa dips slightly southward, and the reservoir-like structure is placed at a point just above the head of a large wash, where a considerable part of the water that falls upon the surface of the mesa could be caught. It is possible that, commencing at the northern end of the settlement, a ditch extended completely through it, terminating in the storage reservoir at the southern end, and that this ditch was used to collect the surface water, and was not connected with the river. A method of irrigation similar to this is practiced to-day by some of the Pueblo Indians, notably by the Hopi, or Tusayan, and by the Zuni. In the bottom land immediately south of the mesa, now occupied by several American families, there is a fine example of an aboriginal ditch.



CAVATE LODGES ON THE RIO VERDE.

In the vicinity of the large ruin just above Limestone Creek, previously described, the boulder-marked sites are especially abundant. In the immediate vicinity of that ruin there are ten or more of them, and they are abundant all along the edge of the mesa forming the upper river terrace; in fact, they are found in every valley and on every point of mesa overlooking a valley containing tillage land.

In the southern part of the region here treated boulder-marked sites are more clearly marked and more easily distinguished than in the northern part, partly perhaps because in that section the normal ground surface is smoother than in the northern section and affords a greater contrast with the site itself. The plate * shows one of these boulder-marked sites which occurs a little below Limestone Creek, on the opposite or eastern side of the river. It is typical of many in that district. It will be noticed that the boulders are but slightly sunk into the soil, and that the surface of the ground has been so slightly disturbed that it is practically level; there is not enough debris on the ground to raise the walls two feet. The illustration shows, in the middle distance, a considerable area of bottom land which

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* See plate on page 370.

the site overlooks. In the plan this site shows a number of oblong rectangular rooms, the longer axis of which are not always parallel, the plan resembling very closely the smaller stone village ruins already described. It is probable that the lack of parallelism in the longer axis of the rooms is due to the same cause as in the village ruins, i. e., to the fact that the site was not all built up at one time.

It is probable that the boulder-marked ruins are the sites of secondary and temporary structures, erected for convenience in working fields near to or overlooked by them and distant from the home pueblo. The character of the sites occupied by them and the plan of the structures themselves supports this hypothesis. That they were connected with the permanent stone villages is evident from their comparative abundance about each of the larger ones, and that they were constructed in a less substantial manner than the home pueblo is shown by the character of the remains.

It seems quite likely that only the lower course, or courses, of the walls of these dwellings were of boulders, the superstructure being, perhaps, sometimes of earth (not adobe), but more probably often of the type known as "jacal"—upright slabs of wood plastered with mud. This method of construction was known to the ancient pueblo peoples, and is used to-day to a considerable extent by the Mexican population of the southwest, and to a less extent in some of the pueblos.

This illustration of the beginnings of pueblo architecture is not as clear as might be desired, yet, if we consider the fact that all kinds of structures are found in this region, and near them various agricultural contrivances, such as garden-beds and terraces on the sides of the hills, farming stations in the valleys below, as well as reservoirs and irrigating ditches, we shall realize how close a connection there was between this architecture and agriculture.

It is a singular fact that there is no part of the pueblo territory where there is a greater variety of stone structures, all of them rude and roughly built, but so few specimens of aboriginal art. The region abounds with caves, cavate houses, a few rude stone-dwellings with the ruins of pueblos scattered here and there, but not a single cliff-dwelling, or fortress or tower, such as are found in the Cliff-Dwellers' habitat on the San Juan, and a very few pueblos which reached a greater height than a two-story building. There may have been a number of straggling villages, such as abounded upon the Gila farther west; villages, such as abounded upon the Pimas, were the chief feature. The region is certainly a favorable place for the study of primitive structures, and especially those which were erected by agricultural tribes.

# CHAPTER XIX.

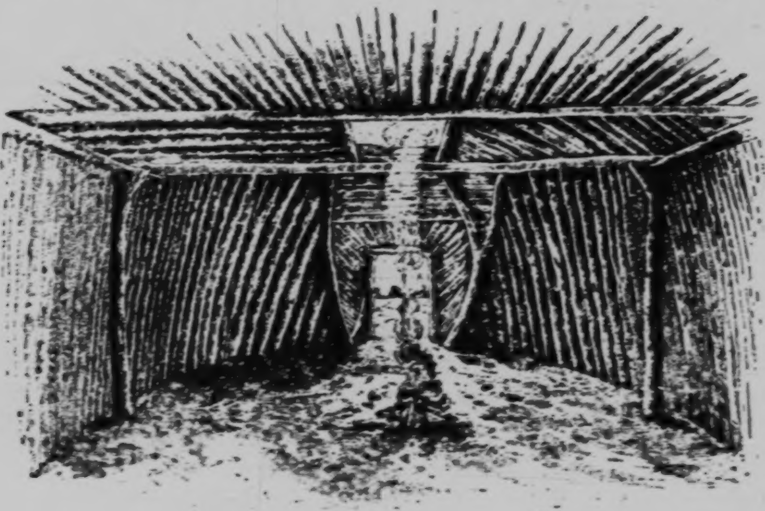
## THE CLIFF-DWELLERS AND THE WILD TRIBES.

We now turn to consider the relation of the Cliff Dwellers and the Pueblos to the wild tribes. There are several questions which arise at the outset. They are as follows: First, Can we say that any of the wild tribes of to-day are actually survivors of the Cliff Dwellers? Second, if not, can they be shown to belong to another stock, and one always antagonistic to the Pueblo tribes? Third, if they belong to the same stock, how do we account for the great change in the religious customs, mythology, symbolism, art, architecture, tribal organization, and government?

These questions are important on account of their bearing upon the science of sociology, and their answer will furnish a basis for new theories as to the beginnings of society and the origin of customs and habits which have come down to historic times. That there is an intimate relation between the savage and his environment will not be disputed. Nature enters into and becomes part of the life of a savage, to an extent which we can hardly conceive. A change of physical environment does not produce an immediate change in the man, or in his arts, but in time, such must inevitably result

It is a favorite theory with some of the recent explorers, that they all sprang from nomadic tribes which drifted into the pueblo country, fell into the same mode of life, and adopted a similar style of architecture, solely as a result of environment, and in proof of this, the following arguments are used: First, that the whole pueblo country is covered with remains of single rooms and groups of rooms, put up to met some immediate necessity, and all kinds of structures which show the transition from the single rooms to the large pueblo with its aggregation of many rooms, the single room being the unit of pueblo construction. Second, that the presence of circular chambers, called estufas, in the groups of rectangular rooms, which in their construction still retain some of the very elements which are found in the rude huts which are still occupied by the wild tribes. It is owing to their religious connection that the form has been preserved to-day, carrying with it the record of the time when the people lived in round chambers or huts. This is the argument used by Mr. F. H. Cushing, who maintains that the columns, or piers, in the estufas are but the survivals of the posts which support the roof and sides of the wooden hut, or hogan, which are still common and are shown in the cut on the next page. Third, the local origin of pueblo architecture is favored by the fact that stone, as material, is everywhere present, while wood is very scarce, in the pueblo territory, and is actually easier to build into structures than wood. A long period of time must have elapsed between the erection of the first rude huts and the building of the many-storied pueblos, but we can imagine that the presence of hostile tribes would drive the people together and force them to build their houses in the shape of a fortress. Moreover, the necessity of digging irrigating ditches and keeping them in repair would favor the continuance of the pueblo life, even after the hostility had ceased.

Now, this positition of the explorers who have studied the pueblos certainly deserves consideration, and perhaps will be accepted by many readers; but there are certain facts which need to be recounted before a final conclusion shall be reached, and to these points we shall call attention.

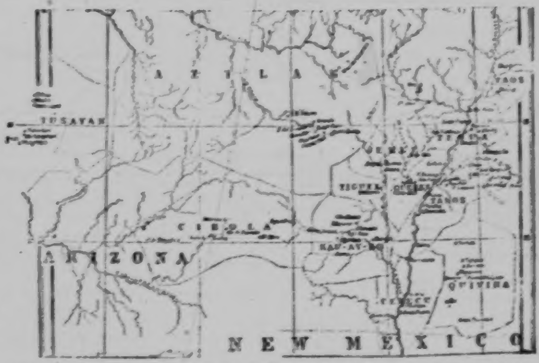


A NAVAJO HOGAN.
Showing posts, walls, and fire-bed.

I. It is a fact that there is a very great difference between the location and social condition of the wild tribes and the Pueblos, and that this difference existed at the very outset of history.

We learn from the Spanish historians that nearly all these tribes were here at the time of the discovery, and were following the same kind of life, very little change having occurred in them in the three hundred years which have passed. The location of these tribes can be learned from the study of the linguistic map prepared by Major J. W. Powell.* They came into this region at an unknown date, and have followed the same mode of life which they do to-day, namely that of nomads and hunters. Each of these tribes has its own habitat, though they frequently wander beyond its limits, and carry on a warfare with other tribes.

The Navajos were on their reservation, which was situated on the San Juan at the point where the four territories—Colorado, New Mexico, Utah and Arizona—unite, the reservation taking a part from each of these territories. The Utes are in the neighborhood of the Navajos, but situated a little to the west of them. The Apaches are a very fierce and warlike people, who do not seem to have had any fixed habitation, but roamed over the entire region; sometimes on the Rio Grande; sometimes on the Rio Gila, and again dwelt on the rivers in Texas. The Comanches were and still are situated at the south-east of the Apaches. The Mojaves are in the same region. The Shoshones belong to a stock which now covers the whole of Nevada, Oregon, Idaho, Colorado, and Texas, but have never penetrated the Pueblo region. The Yumas are California Indians, who dwelt on the borders of the Pueblo territory, but rarely entered it. All of these tribes were hunters and, with the exception of the Pimas, were never agriculturalists. They show in their social condition, as well as in their habit and mode of life, that



MAP OF THE PUEBLO TRIBES AND LOCATION OF THE PUEBLOS.†

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* Major Powell says that nearly the entire mountainous part of Colorado was held by the Utes. The eastern part being held by the Arapahoes; southeastern part by the Cheyennes and the Kiowas. The Comanches extended farther east into Texas. He says of the Shoshones that they were limited at the south by the Colorado River, but to the southwest they pushed across California to the Pacific. The Athapascan was the most northerly tribe. They occupied almost the whole of British Columbia and Alaska, and were divided into three branches—northern, southern, and western or Pacific. The southern group includes the Navajos, the Apaches, and the Lipans. They number about 32,889. The Navajos, since known to history, have occupied the country on the San Juan River in northern New Mexico, Arizona, Colorado, and Utah. Of the Yumas, the great body of the tribes of this family inhabited the peninsula of Lower California. The Pimas had only a small representation in southern Arizona.

† The location of the Pueblo tribes is shown by the map, which was prepared by Mr. Oscar Loew, who attended Prof. Hayden on his first exploration in 1876, and was published in Peterman's "Mittheilungen," and was incorporated by Mr. Justin Windsor in his "Narrative and Critical History of America." This map was designed to show the provinces which were occupied by the different tribes at the time of the discovery by the Spaniards.

they had an entirely different origin from the Pueblos, and that their history was in the greatest contrast. Their languages confirm this conclusion. The languages of the Pueblos are said by Mr. A. S. Gatschet to be very similar, and, in fact, dialectic variations of the same stamp, which sprung from a mother language, but differed largely from the language of the nomadic and hunter tribes. Mr. Gatschet divided the language of the Pueblos into four families. The first included the inhabitants of Isleta, Tewas, Jemez, Pecos, Taos, and Santa Clara, called the Tehua; the second language is spoken in the villages of Acoma, Laguna, and Santa Domingo; the third, the Zuni language, which was confined to the Zuni villages, and the fourth, the Moqui language, spoken in six villages in Arizona. The isolated geographical location of the inhabited mesas, which were surrounded by the deserts on three sides, and drained by the various streams which arose in the mountains to the north, served to keep the Pueblos apart for a long time, and left the people free to develop their institutions and social life uninterrupted.

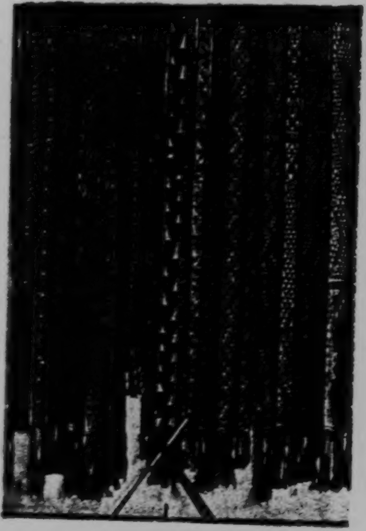
MODERN PUEBLO POTTERY.

Here, upon the Rio Grande and upon the Colorado and its branches, with the mountains to the north, and the deserts to the south and east, they followed their peculiar mode of life, and continued to develop the resources of the country, struggling with the difficulties of the climate and soil, until they conquered, having learned the secrets of success by their own experience. They wrested from nature a living, and grew into a grade of civilization, which has never been equaled by any wild tribe. The momentous problem as to the countries which were the former seats of the Pueblo tribes before they settled here, cannot be solved from purely linguistic data, as even archæology and ethnology fail to furnish sufficient evidence. Ethnology refuses to remove the veil which envelops the mystery. Affinities have been claimed with the Aztecs and Central American tongues, but are too scanty to prove common origin. The wild tribes which have been described differ so much from them, both in language and in customs and habits, that they are acknowledged to be derived from entirely different stock. It is easier to trace the identity of Pueblos with the Cliff-Dwellers, than that of either of these with the wild tribes, for the contrasts appear as soon as we begin to study the language and customs. Proximity of territory is certainly not sufficient to prove identity of origin. The Apaches, Comanches, and the Utes still dwell in the region which has been considered the habitat of the Pueblos. The Navajos live in the very midst of the cliff dwellings, but they do not claim that either they or their ancestors ever built these dwellings, though the Utes have a few traditions as to the abandonment of the cliff dwellings, and to the course which the people took when they migrated to the southward.

MODERN PUEBLO POTTERY.

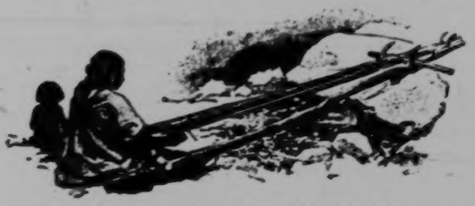
The over placement of the two races, which was recognized by the early explorers, seems to have continued up to the present day, but has only served to obscure the former condition and threatened to blot out the history of the Cliff-Dwellers altogether. The conviction, however, seems to be growing that there were two great races—one earlier, and the other later; one from the north, and the other from the south. The two met here, like the great heaving tides from the ocean of living beings, which throbbed with the pulsations which would not cease, and heaved to and fro, forever beating against the shores. The earth, like a sleeping giant, remained passive, while the strokes of nature and art sought to wake it to life, as the Scandinavian god Thor did the sleeping giant, by his hammer. The caves, like the mythical glove, were open and uninhabited until the visitor from unknown lands entered them. Time wrestled with the powers of nature, like the hag with which the god Thor contended and overcame the giant. The drinking horn which connected with the great ocean could not be drained. There were hidden resources, of which man had not dreamed. The wild tribes came out of the untamed forests and never learned the secrets that were hidden here. They never dispelled the charm, or solved the mystery. It took the Pueblos a long time to learn the secret, and much patience was required before they understood the moods of their mother earth.

A war-like race and a migratory people could not and would not coax the soil to yield its products. They might worship the gods of the mountains, and might be led by the divinities who were heroes, born on the summits where the clouds meet; they might pass from house to house, through the many-colored doors which separate the clouds; they might find lodges in the valleys where there was a sleeping body, and by a charm given to them by the divinity, recover the manhood which was prostrate, and clothe themselves with a power which was lost, and come forth as warriors. The Pueblos were a different people from the beginning. They were peaceable, industrious, and mild. Women had a great influence among the Pueblos. They were not permitted to enter the estufas, nor did they often bear office or serve as rulers, but in their homes they were supreme and the children were exclusively under their care. The children were at a certain age initiated into the clan to which their mothers belonged, with great ceremony, and received their given names, the godfathers acting as sponsors for them; the priests serving as the officers who were empowered to bestow upon them the sacred gift of immortality, by breathing the breath of divinity across the plume which represented the prayer and cloud alike. The boys were, however, initiated into the secret


BELTS WOVEN BY THE TARAHUMARIS.

societies whose emblem they saw in their dreams, after they had fasted long and gained their second sight.

The Pueblo life was so different from that of an ordinary Indian, that we cannot understand them until we rid ourselves of our prejudices and enter into sympathy with their peculiar notions. We need to climb up the steep trails to reach the summit of the mesas, and look away to the mountains in the distance, to realize how much they were influenced in their inner fibre by the scenery. Even the Cliff-Dwellers seem to have been influenced by scenery. Their houses were built on the steep and inaccessible cliffs, and had the least possible degree of convenience to water, but there was that in their surroundings, which made them superior to their enemies. They were generally at peace among themselves, and when surrounded by dangers, followed industrious pursuits and cherished their love of art.



LOOM USED BY THE TARAHUMARIS.

II. We see the contrast between the Pueblos and the wild tribes in the specimens of art which have been preserved; their basketry is often woven into graceful shapes and decorated with many beautiful patterns. Their pottery differed from that of the wild Indians in nearly every respect, and especially in the symbols, which are represented in it. Some of these symbols are very modern, for they represent domestic animals which were introduced by white men; but others present patterns, geometrical figures, symbols, and ornaments, which a trained eye had learned to recognize in nature. They represented the mountains, by terraces; the sky, by arches; the winds, by coils and spiral lines; clouds, by stepped figures; the sun, by a disc; the moon, by a crescent; the lightning, by the serpent; the rain, by perpendicular lines; the rainbow, by different colors; the water, by certain animals; the air, by birds; the earth, by horizontal lines; the four points of the compass, by crosses, and the gods which preside over the four quarters of the sky, by fetishes in the shape of animals. They covered themselves with masks, which represented the dark creatures of the earth, and were very mysterious. These were calculated to inspire the children and all spectators with terror. They covered their divinities with masks, and hid the supernatural beings behind a screen which was full of emblems of the nature powers. If there was anything mysterious in nature, they borrowed it to put into their masks. Their clothing was covered with symbols.

Every little figure which they wove into their garments was a symbol. Their sashes, their kilts, their scarfs and necklaces, their greaves, their bracelets, wands, baskets, and bags, their headgear and every article which they wore was symbolic. The motions of the dancers, the steps and attitudes which they took, even the grotesque and accidental ways in which they acted out their thoughts and beliefs were significant. The pouring of water on processions as they passed, and the tricks which they played on one another, were burlesque symbols.

Some of the wild tribes had symbols and ornaments which were similar to those of the Pueblos The Navajos were especially successful in making sand paintings, and were able to give a significance to every part. They had a mythology of their own, which is very beautiful. The Navajos have many myths which show an inherent nobility, and seem to have caught some inspiration from the mountains.

It will be acknowledged that some of the wild tribes are skillful in weaving and pottery. There are no better blankets than those which are woven by the Navajos. The Tarahumaris, who have been oppressed, and may be regarded as the most impoverished of any of the tribes of the south, are especially skillful in weaving belts. They use a very primitive loom, which can be transported from place to place. In weaving, they generally resort to the shade of some tree, and spend the time in trimming the belts with gay colors and various patterns. The following is the description of this people given by Mr. Lumholtz:

> The Tarahumaris are intelligent and industrious. They plant corn upon the crests of the Barrancas in March, and when the rain begins in June they descend into the canyon, to plant corn there. They harvest first upon the high ridges, afterwards in the canyons. They cultivate corn, beans, potatoes, tobacco, and pepper.
>
> Dancing, with the Tarahumaris, is a work to secure rain and good crops. There are four or five kinds of dances practiced. They imitate the motions of animals, and the songs implore the animals help. They look upon plants as individuals to be treated with the utmost respect, in fact, as demi-gods, to whom sacrifice must be offered. This plant worship is peculiar to them, though animal worship, rain worship, and the snake dance are common among the Pueblos farther north, as we have seen.
>
> The women are clever in weaving blankets, girdles, and clothing on primitive looms; but their pottery is exceedingly crude, and its decoration is infantile, as contrasted with the Cliff-Dwellers' work. The people are utterly devoid of the architectural gift which resulted in the remarkable rock structures of the early Cliff-Dwellers.*

This is also true with the Queres, and exemplified in the plainest manner through their symbolism The symbols of the Queres are the same as those of the Zunis. The forked line not only indicates lightning, but also the serpent with the forked tongue. The water has several symbols, according to the form in which it appears. As cloudy vapor, it assumes the form of a double staircase, imitating the cumulus clouds which rise from the earth to the sky; or a group of arches, emitting rain streaks and lightning darts. As streams, or water, resting or flowing on the surface, are represented by the snake, the snake with horns and without the rattle; so the rains, by the water serpent, distinct from Shrug, the rattlesnake. The Tzitz Shrug is the spirit of the watery element, the horn is its head-dress or symbol of spiritual power. The entire symbolism of the Queres is derived very plainly from natural phenomena. The spiral, double or single, in curves or angular lines, stands for the whirlwind; the cross, for the stars in general, and the white cross and the red cross, for the morning and evening stars, respectively; the tracks of the pheasant (called road-runners), arranged in a circle, form a magic ring around the object or person they surround; here, as well as at Zuni, certain animals symbolize certain regions or cardinal points. There are local shades in their symbolism that constitute differences: thus the colors attributed to the six sacramental regions by the Queres, are not the same as those attributed by the Tehuas or the Zunis.

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* See Bulletin of the American Geographical Society, page 299.

The pictography of the wild tribes did not equal that of the Pueblos, and contained no such symbolism; nor were there such deposits in the graves, as are found near the pueblos. Dr. J. Walter Fewkes has recently made discoveries which illustrate this point. These discoveries were made at Hamolabi, one of the ancient Tusayan villages. The following is his description:

> The great collections of prehistoric objects which were taken at Hamolabi, came from the necropolis, or burial place, which is most wonderful in its revelation of the character of ancient life. The cemeteries were situated just outside of the town, only a few feet from the outer wall. Almost every grave was indicated by a flat stone slab,[*] which stood upright or lay above a skeleton. Some of these stones were perforated with round, oval, or square holes. The habit of placing mortuary votive offerings seems to have been almost universal, for almost every grave excavated contained one or more objects of pottery, stone implements, ceremonial paraphernalia; valuable ornaments were left on the bodies of the dead. The large number of vessels belonged to the red and black, and black and white varieties,[†] identical with those said to be characteristic of the Cliff-Dwellers, showing that the ancient Pueblo villages made the same kind of pottery, and adorned it in the same way.
>
> The pictographic decorations of Hamolabi pottery, which can be identified, are few in number. The figures of birds predominate; in one instance was a figure of a spider in a food basin, it had the four pairs of legs, globular body, and prominent mandibles; on the outer rim of the bowl was a figure of the sun, similar to that made on the floors of the sacred rooms, or kivas, in the celebration of ceremonies. In modern mythology, the spider woman is associated with the sun. She is an earth goddess, the bride of the sun, and the mother of the twin war gods. The symbol of the sun is depicted on the pottery; also, on the altar screens of the "palulakonti" or serpent sun ceremony.

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[*] These slabs remind us of the graves which were found by Mr. Holmes on the mesas, near the cliff-dwellings of Montezuma Canyon. They have already been described.

[†] Black and white ware is the most abundant kind among the cliff-houses, though it is not confined to them. This indicates that the occupation of cliff-dwellings of the Mesa Verde and ancient pueblos was contemporaneous.

A second ruin was discovered three miles beyond the first. It was much larger, and crowned the top of a mesa 200 feet high. The rooms were well marked, and the remains of the wooden beams were still present. The graves were marked with the same rectangular stone slabs. Food bowls were found, ornamented with a picture of a human being with flowers and butterflies.

The ruins on Chevlon Creek, near where it flows into the Little Colorado, fifteen miles from Winslow, presented a rectangular wall, with rows of rooms apparently enclosing a plaza. Cemeteries yielded a majority of the articles collected. The burials were indicated by flat stones, some upright, but mostly horizontal. Basket plaques were buried with the dead, some of them painted a green and blue color; also, stone slabs ornamented with triangular figures, which resemble those on the walls of the kivas and the cliff-houses of the Mesa Verde and those which are painted on dados of modern houses, though reversed, and embroidered on wedding blankets where they are called butterfly symbols. It has been suggested that they are rain cloud symbols. An axe of white stone, ornamented with a simple incised cross, was found, and several arrow straightners; one in the form of a frog. Metates, or grinding stones, in the graves, commonly inserted over the skeleton of a woman, indicated the sex of the dead. The most beautiful ornament was a fetich of shell, encrusted with turquoise, inlaid with rows of turquoises nicely fitted together with the form of a frog. This was taken from the breast of a skeleton, several feet below the surface, and, as an example of mosaic work, is unsurpassed. A few specimens of shell carving, cut in the shape of a frog with perforations for eyes, were found in the Chevlon ruins; also, many shell amulets, bracelets, finger rings and perforated shells; wood, bone, and shell encrusted with turquoise mosaics; fragments of a bow and arrow, the property of a warrior priest. The pottery from this ruin has many resemblances to the ancient Zuni ruins, but the symbolism is essentially the same as that of the Tusayans, showing that there was a closer similarity between them in ancient than in modern times. Several vessels of clay, painted and fired, were made in the forms of animals and birds, the most striking had the form of a macaw or parrot, made in a conventional way. This connects the clan with the south, where the parrot is found. One naturally recalls the intimate association of the bird and snake, which has been worked out in so clever a way in the Yucatan ruins.

The ruins at Chaves Pass were visited. This Pass from prehistoric times was one of the few available passage-ways over the Mogollon Mountains, and through it ran an old Moki trail, reputed to have been used by the Hopi traders in visiting the people south of the mountains. Several hundred skeletons were exhumed and a copper bell, which is the only specimen of metal found. This bell was found ten feet below the surface, with a human skeleton. It is identical with bells found in graves in Salado Valley at Casa Grande and Old Mexican ruins. Its form is identical with those made and used by Mexicans and Central Americans out of gold and copper, prior to the advent of the conquerors. There was taken from the ruins of Chaves Pass, a type of ancient pottery which has never been found among the Moki ruins. It is decorated with black, brown or red lines, with white margin. It indicated a well-marked difference between the old Hopi and the ancient Patki pottery. The striking figure of a bird with a long projecting beak characteristic of many masks used in modern Katcina dances, also the figure of a racoon, which was a mythical animal in the Hopi pantheon are found. The pottery found in the Chaves Pass was practically identical with that from the Colorado, Cochiti, and Verde Valley, showing that the people were formerly closely related. At Walpi, the old men say that their ancestors built the pueblos of the Verde Valley.

III. The architecture of the Pueblos differed from that of the wild tribes. Any one can realize this, who will compare the terraced pueblos with the tepees or huts of the hunter Indians. The former are generally built of stone and arranged either around the courts in which the kivas were situated, or in long lines, with passage-ways* between them, and usually with a wall surrounding them. As to the characteristics which are shown by the pueblos, we may notice the following elements: 1st, the walls; 2nd, the terraces; 3rd, the balconies in front of the terraces; 4th, the apartments and the doors into them; 5th, the courts which were enclosed by the walls; 6th, the kivas within the courts; 7th, the gateways through the walls; 8th, the walls which surrounded the entire village, making a separate enclosure; 9th, the inner rooms, or apartments, above the terrace; 10th, the store-rooms below the terrace; 11th. the towers, which were frequently placed outside of the pueblos; 12th, the garden plats and farms near the pueblos; 13th, the springs and sacred wells; 14th, the shrines, which were sometimes placed a a distance on the hill tops; 15th, the trails and stairways which led up to the mesas; 16th, the irrigating canals. All of these elements are found in the ruins of the ancient pueblos, showing that there was a great uniformity of pueblo architecture everywhere. What is more, the same elements are found in the cliff-dwellings.

The wild tribes differ from the Pueblos, and among themselves as to the manner of erecting their tents or tepees. A Pima house is round, like a bee-hive; four posts supporting a rough frame of boards or branches, form the basis of this structure. Long, bent poles are so placed as to meet above this rude platform, to which they are tied. Hoops encircle the bows, and hold them laterally. Over this skeleton, earth is placed. Sometimes a layer of grass or brush is first applied to the frame. The whole is nothing else but one of the well-known "dirt roofs" that can be seen in any part of New Mexico, with the difference, however, that the dirt roof of the pueblo rests on a wall of stones or mud (adobe), whereas the Pimas' roof rests on the ground and forms a compact cupola.

The Navajoes and Apaches build their tepees or wigwams in conical form. They insert poles into the ground in a circular form and draw them in to the top, bind them together, and cover the whole with a skin; leaving a hole at the top for the escape of the smoke, though their winter houses are built more like the dirt houses of the Pimas, but differ from them in that the door projects something like a dormer window, and has blankets of different colors hanging in front. The Navajoes have the singular custom of painting the roof of their sacred tent or hut with the semblance of a humanized rainbow, the arch covering the top, but the feet and legs are upon one side, the arms and head upon the other, near the ground It shows that their mythology and religion was a nature worship, or worship of the sky. They have no such kivas as the Pueblos have, and do not regard the fire as sacred, or, if they do, they have no such custom of leaping over it as the Pueblos have. Their sacred tent is not divided into ledges, and has no such thing as a sipapuh, or place of emergence. The cut illustrates the points mentioned above.

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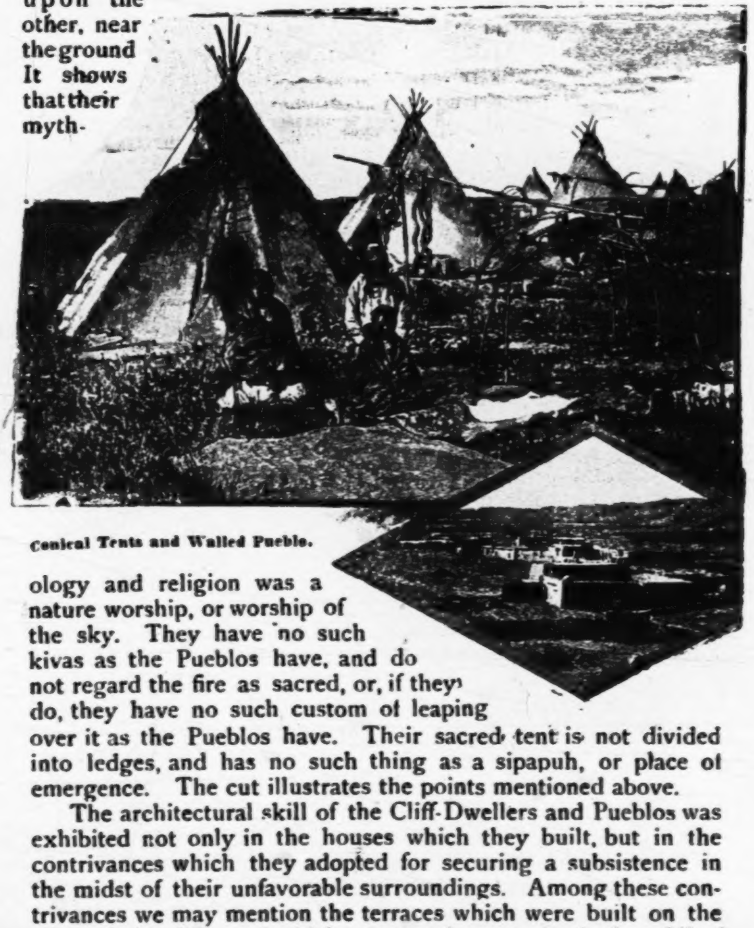
* In the village of Oraibi the passages were nearly all perfectly straight. The houses were arranged in parallel rows. In Shumo-pavi the houses were arranged about a hollow square, to which there was an entrance only at one corner The terraces sloped toward this court. In Mashongnavi there were three such hollow squares, with a single entrance to each, the great communistic houses being arranged in parallel rows, with transverse rows across the end of each court. In Pescado and in Neutria, which are old villages, the houses are arranged about a large, irregular court, and form an eliptical figure, with several openings through the elipse in the interior. In Neutria the village is in the form of a crescent, with a block of buildings between the houses. In Kintiel the buildings are arranged in the form of an irregular circle; the court is in the centre, which is drained by a sink in the mesa, but there are excavations in the court which are designed for the storing of water. In the Zuni village there is but one large court. All of the buildings are arranged around this, forming great blocks in which the stories rise above one another, the highest story being in the centre, thus making an irregular pyramid. The passsge-ways between the buildings are long and narrow, and always diagonal. The pueblos on the Rio Grande are generally compact and isolated, and are out in the open. There are very few enclosures or courts within them.

Zuni has been built at a point having no special advantage for defence; convenience to large areas of tillable soil has apparently led to the selection of the site. This has subjected it in part to the same influences that at an earlier date produced the carefully walled fortress pueblos of the velleys, where the defensive efficiency was due to well-planned and constructed buildings.



Conical Tents and Walled Pueblo.

The architectural skill of the Cliff-Dwellers and Pueblos was exhibited not only in the houses which they built, but in the contrivances which they adopted for securing a subsistence in the midst of their unfavorable surroundings. Among these contrivances we may mention the terraces which were built on the sides of the cliffs, and which were used as garden-beds. All of the explorers have spoken of these with admiration. Mr. Nordenskjold describes the terraces in Navajo Cañon. He says:

A little south of Step House, the talus slope was divided by low stone walls, built, one above the other, into level terraces, evidently designed for garden plats; the same as Bandelier found on the Gila, which resemble the hill-side terraces, in the vine-producing districts of southern Europe.

It is evident that when the stone buildings were erected, the people ranked higher in culture than the nomadic Indians. They had permanent domiciles made with great skill, in roughly-dressed blocks laid in regular courses. In architecture they had secured great proficiency. Other remains show that they were agriculturists. The examination of objects found in the ruins, witness to their skill in the art of pottery.

Lieut. Ives speaks of the terraces and reservoirs near the Moqui pueblos. He says:

> I discovered, with a spy-glass, two of the Moquis towns, eight or ten miles distant, upon the summit of a high bluff overhanging the valley. They were built close to the edge of the precipice, and, being the same color as the mesa, it would have been difficult to distinguish them, even with a glass, but for the vertical and horizontal lines of the walls and buildings. The outlines of the closely-packed structures looked, in the distance, like the towers and battlements of a castle, and their commanding position enhanced the picturesque effect. When the darkness fell, camp-fires—probably those of the Moquis herdsmen—could be seen scattered along the further side of the valley. On either side the bluffs were cut into terraces, and laid out into gardens, which were irrigated from an upper reservoir. The whole reflected great credit upon the Moquis' ingenuity and skill in the department of engineering. The walls of the terraces and reservoirs were of partly-dressed stone, well and strongly built, and the irrigating pipes conveniently

arranged. The little gardens were neatly laid out. The walls of the terraces are kept in good condition and preservation. The stone and earth for their construction they carry in blankets upon their shoulders from the valley below.

The most remarkable specimens of terraced hills are those in the Sierra Madre in Mexico. The following is the description given by Mr. Lumholtz:

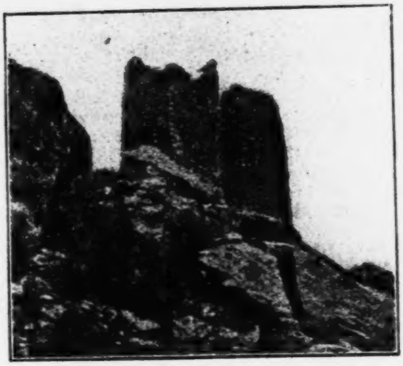
> This Sierra Madre region is very rich in remains of a long-ago-vanished race of people, of whom history as yet knows nothing. Deserted pueblos, containing square stone houses, are frequently met with. They are generally found on top of the hills and mountains, and are sometimes surrounded by fortifications in the shape of stone walls. Isolated houses, made of stone and clay, and plastered, so that they look white at a distance, are also found, and the Mexicans call them Casas Blancas.
>
> The most interesting remains are, however, in the caves, which contain groups of houses, sometimes three stories high. Trincheras, or stone terraces, are built across nearly every little valley—ten to twenty in number in some of them—evidently for agricultural purposes. On very steep mountain sides, these terraces were astonishing structures, fifteen, and even twenty, feet high, and of great solid stones, in the cyclopean style of masonry.

The defensive architecture of the Pueblos is a most distinctive and prominent feature. This, some of the recent explorers and those who are connected with the Ethnological Bureau, have minimized, and have maintained that there were no fortresses, but they are inconsistent with themselves. Mr. Mindeleff says:

> Fortresses, or other purely defensive structures, form a type which is entirely unknown in the pueblo region. The reason is simple: military art, as a distinct art, was developed in a stage of culture higher than that attained by the ancient pueblo builders. It is true, that within the limits of the pueblo region, structures are found which, from their character, and the character of their sites, have been loosely described as fortresses, their describers losing sight of the fact that the adaptability of these structures to defense is the result of nature, and not of art. Numerous examples are found where the building of a single short wall would double the defensive value of a site, but, in the experience of the writer, the ancient builders have seldom made even that slight addition to the natural advantages of the site they occupied.
>
> The first desideratum in the minds of the old pueblo builders in choosing the location of their habitations, was nearness to some area of tillable land. This land was generally adjacent to the site of the village, and was almost invariably overlooked by it. In fact, this requirement was considered of far more importance than adaptability to defense, for the latter was often sacrificed to the former. These statements are true even of the so-called fortresses, of the cavate lodges, of the cliff ruins, and of many of the large village ruins, scattered over the southwestern portion of the United States. Among the ancient pueblo builders there was no military art, or rather, the military art was in its infancy; purely defensive structures, such as fortresses, were unknown, and the idea of defense never reached any greater development than the selection of an easily defended site for a village, and seldom extended to the artificial improvement of the site.

This is utterly in disagreement with the testimony of the Spanish explorers. The following is the description given by Castaneda. He says:

Certain houses are used as fortresses; they are higher than the others and set up above them, like towers, and there are embrasures and loopholes in them for defending the roofs and different stories, because, like the other villages, they do not have streets, and the flat roofs are all of a height and are used in common. The roofs have to be reached first, and those upper houses are the means of defending them. It began to snow on us there, and the force took refuge under the wings of the village, which extend out like balconies, with wooden pillars beneath, because they generally use ladders to go up to those balconies, since they do not have any doors below.



TWIN TOWER IN RUIN CANYON.

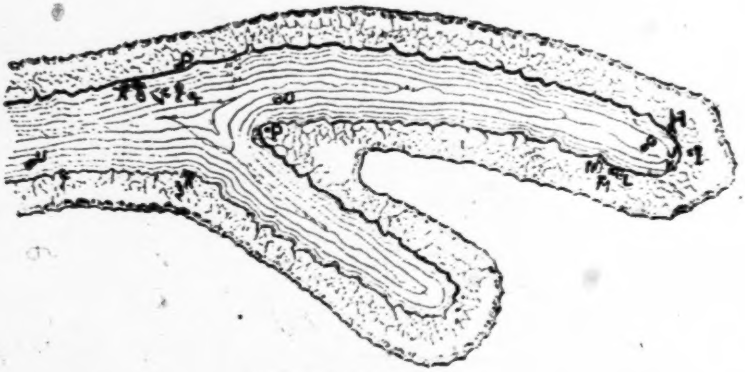
The following is his description of Pecos, or Cicuye, the village which the Comanches, (a wild tribe), had besieged, but had been unable to capture on account of its strength:

Cicuye is a village of nearly five hundred warriors, who are feared throughout that country. It is square, situated on a rock, with a large court or yard in the middle, containing the estufas. The houses are all alike, four stories high. One can go over the top of the whole village without there being a street to hinder. There are corridors going all around it at the first two stories, by which one can go around the whole village. These are like outside balconies, and they are unable to protect themselves under these. The houses do not have doors below, but they use ladders, which can be lifted up like drawbridges, and so go up to the corridors, which are on the inside of the village. As the doors of the houses open on the corridor of that story, the corridor serves as a street. The houses that open on the plain are right back of those that open on the court, and in time of war they go through those behind them. The village is enclosed by a low wall of stone. There is a spring of water inside, which they are able to divert. The people of this village boast that no one has been able to conquer them, and that they conquer whatever villages they wish.

SQUARE TOWER IN RUIN CANYON.

This quotation shows that the Pueblos were at this time beset by the wild tribes, and were obliged to dwell in fortified villages. The same is proved by the cliff dwellings farther north, especially by those which have been recently discovered in Ruin Cañon, and are described in *Popular Science* for April, 1899, by Mr. W. K. Moorehead. Cuts illustrating them have been kindly loaned us, and are furnished here. The following description is his:

> The canyon that contains the ruins does not average more than seventy feet in depth It is not very wide, yet a wilder place can scarcely be imagined: great crags of sandstone jut out on either side; masses of rock have tumbled into the gorge below; a dense growth of sage bush covers the bottom; while the topmost ledges hang for many yards over the cliff, forming natural caves. The inhabitants took advantage of the inaccessible nature of the gorge, and have built four kinds of structures: First, large towers, with very thick walls, placed upon commanding positions; second, small pueblos, built so as to be protected by the towers; third, cave dwellings or cave-villages, which consisted of one or more walls enclosing a natural cavern in the rock; fourth, cave shelters or hollow castles, the boulders forming the inner walls and roof of the habitation; while circular walls were built on the exposed side, thus making within the hollow two or three rooms resembling caves. One of the boulders has the remains of a tower on top.
>
> The first ruin in sight, is a large tower, or two towers, named "The Twins," built on large, oblong, sandstone boulders. One (A) is sixteen feet high, and nineteen feet across; one side square, the other rounded. The rock upon which it stands is twenty-four feet high, and forty-eight feet in length. There are port-holes, three or four inches in diameter, on all sides. There are four rooms in the tower upon the ground floor. The other tower (B) is twenty-one feet in height, twenty-one feet in diameter, and the walls fourteen inches in thickness; the rock upon which it stands is thirty-four feet in height, separated from the cliff by a fissure eight feet in width, it is divided into six rooms upon the ground floor. There are numerous port-holes in the tower. Underneath the twin towers was a cavern, fourteen feet in width and five feet high, in which were two small cave-dwellings. Stronger habitations could scarcely have been constructed. There was but one entrance to each room. The entrances to the towers (A and B) are toward the canyon, and necessitated the use of small ladders, which the occupants could



MAP OF RUIN CANYON.

draw in, while the enemies would be obliged to scale the cliff. The rafters in all the towers are in the last stages of decay. The masonry is excellent, sandstone averaging 14 x 5 x 4 inches has been used in the construction.

When one considers that all these thousands of blocks were hewn out by stone tools, fashioned into buildings by primitive masons, that arches, doorways, windows, and port-holes were accurately, neatly, and substantially constructed, one must accord the builders a degree of architectural skill reached only in other lands by people who had the use of metal.

Hollow Boulder (C) stands in the valley at the junction of the upper canyons. It is thirty-nine feet long, and twenty feet high.* Beneath the boulder is a hollow cave, which is walled and divided into two rooms. There are the ruins of a tower on top of it. A spuare tower (D) stands upon the topmost ledge, where the canyon forks. The entrance faces the canyon. There are no windows, but twenty port holes in the walls. The entrance is three or four feet from the edge of the canyon. It commands the unprotected boulder, shrine, or dwelling below. The square tower (G) is the tallest tower standing. It was built upon a boulder ten feet high, sixteen feet wide, and twenty feet long. It originally had four stories, three of which are now standing. There are no port-holes in the lower story, a number in the second, and very many in the third. The fourth story commands the plain above. The doorway is T shaped. The tower tapers at the top. It was designed for defence. Should the enemy succeed in eluding the other towers, they would be unable to pass this in safety. It will be seen from the map that the ruins are all bunched together at the head of the canyon. It seems to have been a preferred spot for dwellings, and, consequently, a very vital point to be defended. Here were two caves, marked K and J on the map, tower G splendidly commands both of these. One of these was 150 feet in length, and twenty feeet in height, and contained a large compartment dwelling of nine rooms, which covered an extent of about sixty feet in length, fourteen feet in height, and sixteen feet in depth. Upon the summit mesa, extending back from the edge is a good-sized pueblo in ruins, protected by two buildings which have numerous port-holes.†

A MASHONGNAVI WOMAN.

A MASHONGNAVI GIRL.

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* This boulder has been called a shrine, and is described on page 330.

† Mr. Louis W. Gunckel has spoken of several other cliff-villages in the same region. One is called Giants' Cave; another, Monarch Cave; another Hawk's Nest Cove.

The dwellings L, M and N are the most important ruins in the entire canyon, and show the best architectural skill. They are situated directly upon the edge of the cliff. One of these is circular toward the east. There are port-holes pointing directly downward, so that a man standing at the base could be shot by those above. Tower P is on the point where the canyon divides. It stands on a high boulder and commands an important position. Tower O stands on a high boulder about half-way down the side of the canyon. R is a good-sized compartment house, having six rooms, two stories in height, on the edge of the cliff. Castle U is a strong compartment house, built upon a huge boulder, separated from the cliff by a fissure thirty feet in width, and twenty-five feet deep.*

The contest between the wild tribes and the Pueblos is also shown by the ruined hill top forts, on the Rio Verde. These have been described by Dr. J. W Fewkes, as follows:

These fortified hill-tops are abundant in the neighborhood of the Red Rocks. One of the best examples, is a fortification which crowns the summit of a mesa at Oak Creek. Here the whole top, which is level, is surrounded by a wall at its edge. The ascent is impossible, save at one point where the trail is defended by a circular bastion. I believe that these structures are fortified retreats, similar to the utncherias of Sonora, and those of the Sierra Madre and the Magdalena Valley.

NAVAJO PRIEST.

The defenses of this region are very interesting on account of their proximity to the boulder sites, pueblos, hill top-forts, and other structures, and because they are situated outside of the region which was strictly Pueblo territory. A north and south line, running a little west of the Tusayan villages, would separate the inhabited pueblos—the most of which are still built after the fashion of a fortress—from the ancient ruins on the Rio Verde. The hill-top-forts show that even this region was invaded by the wild tribes. and was abandoned because of their continued presence.

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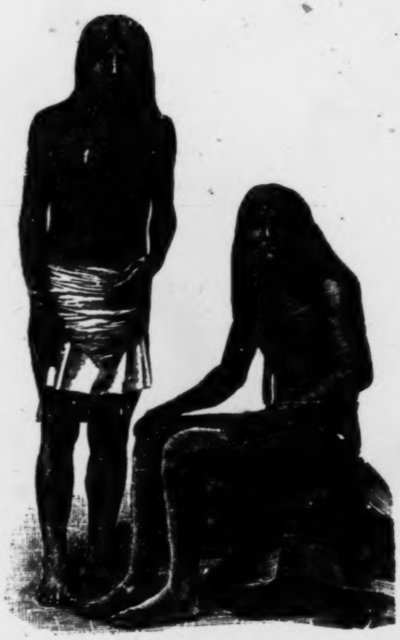
* These various towers, A, B, D, P and O, along with the boulder C, and the tower U, are so situated as to prevent an enemy from passing up the canyon to the village, or cluster of buildings, M, L, N, K, G, H and I, at the end of the canyon. These show great strategic skill on the part of the Cliff-Dwellers.

IV. The contrast between the Pueblos and the wild tribes is manifest not only in their works and relics, but especially in their dress and physical appearance. We shall, therefore, call attention to them.

The wild tribes remain in about the same condition that they were before the time of the Discovery, and are separated from the Pueblos by two or three periods of progress. Their clothing shows the difference between them. The wild tribes generally went nearly naked, but the Pueblos were thoroughly clothed, except when engaged in their religious ceremonies.

Imitation is a faculty which is common with all Indian tribes, and there is no doubt that the wild tribes and Pueblos alike borrowed many customs and forms of art from those who were at a distance. Still the modern Pueblos have passed from the age of stone into the age of iron, without the use of copper or bronze; but the antiquated plough, the two-wheeled cart, the clumsy iron-ox, the imperfect saw are now found among them. In place of the wooden stick, they use the hoe in planting. They also use the chisel and auger in place of the fire-drill. They raise wheat, barley. melons, apples, pears, peaches, and grapes; own cattle, sheep, domestic dogs and cats. They use wool for their garments, and use the old musket, powder and lead instead of the bow-and-arrow; but they are still in a state of transition from stone to metal. Their pottery is not as elaborate and as full of symbolism as centuries ago. It contains figures and ornaments, which are evidently borrowed from the white man, mingled with others which were inherited from their fathers.



APACHE RUNNERS.

The cuts show the contrast between the Indian tribes. In one group we have a Sioux warrior, a Navajo, and a Ute dressed in modern costumes, showing the effect of contact with the whites; but the spears and arrows show their original weapons. In another case, the Pueblo woman is dressed in modern costume, but she shows more taste and neatness of apparel. The usual custom or style of wearing the hair is shown in the picture of the girl. The picture of the Apache runners shows the form of the hunter Indian, as compared with the Pueblos.

The wild tribes differed among themselves; but the Pueblos were everywhere the same. The Navajoes cultivated by irrigation and lived in log-cabins, while their cousins, the Apaches, moved to and fro, subsisting on the chase, and on murder and rapine. The Yumas in Central Chihuahua were village Indians; whereas those of New Mexico lived in a condition little better than that of the tribes of the Plain. On the other hand, the tribes on the Rio Grande irrigated their lands, while the tribes on the so called "Médano"—those who inhabited the village of Tabira and its neighboring settlements, who were strictly Pueblos — depended upon the annual precipitation for their crops, and upon tanks for their drinking water.

Many of the Apaches dress in skins, or with a blanket around the waist, the remainder being left completely nude. They paint their faces or bodies with lines of black and white, which are symbolic of the nature powers. They are tall and straight, usually with black eyes. Their hair is coarse and black. Their dances are such as were common in prehistoric times; they still continue the scalp dance, and occasionally the deer-dance, in which the performer wears a deer mask with its antlers and does the jumping and high-stepping, imitating the motions of the deer. Some of them live in caves, and scarcely plant or raise anything, but subsist mainly by hunting. They have a conception of the four cardinal points as mystic regions, and a folk-lore which differs entirely from that of the Pueblos. Their burial customs differ. The dead body is neither burned nor entombed. It is enclosed by a rude hut or bower built of rubble or stone, the weapons placed beside the body. Pottery vessels are perforated or broken—"killed," as the saying is. Ornaments, trinkets, and plumes are added to the other articles that shall accompany the departed one to the happy hunting ground.

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